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USSR Report

TRANSPORTATION

No. 42

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AIR

DIRIGIBLE DEVELOPED AT UFA PETROLEUM INSTITUTE

Moscow TRUD in Russian 11 Feb 81 p 4

[Article by V. Vlasenko: "An Aerial Trolley"]

[Text] An original model of a dirigible has been developed at the Ufa Petroleum Institute.

Interest in this flight vehicle is valid now when much attention is being devoted to development of new types of transport facilities required for working in difficultly accessible locations. According to theoretical calculations, the use of a dirigible is three times more efficient than the use of an aircraft and is 15 times more efficient than using a helicopter. However, specialists and enthusiasts were unable for a long time to develop such an air ship whose disadvantages would not detract from its advantages.

An operating model of a dirigible, a little smaller in dimensions than the Salyut space station, rose two meters into the air at the laboratory of the Chair of Rock Mechanics. A foam plastic crate on which the word "Cargo" was painted in bright red color was attached to the base of the minidirigible.

One of the developers of the model, Associate Professor G. I. Vasil'yev, turned the handle of the switch and the dirigible slowly floated to meet us. Incidentally, it would be more accurate to say that it floated and travelled. This would be exactly correct for the given model. The "fuel" for it was not gasoline nor kerosene, but electric current. How does the development of the Ufa workers differ from the common types of dirigibles?

Each of us is probably aware of the operating principle of an ordinary trolley. And if the trolley is disassembled, we can see the working principle of this dirigible. Instead of a steel body, of course a polyethylene shell 90 meters long and 30 meters in diameter filled with nonexplosive helium is used. Unlike hydrogen, it does not tend to explode at the most inopportune moment. Three electric motors equipped with propellers are attached to the base of the dirigible. They will push it forward or backward. Two motors are installed at both ends of the shell. Their task is to prevent drift of the craft by lateral winds. Two strong cables are stretched above the contact wire. A car connected to the dirigible by wire rope is installed on them. A pantograph which transmits current from the system to the electric motors is attached to the bottom of the car. Is it not true that all this is similar to the working principle of an ordinary trolley.

And the dirigible model begins to move with a turn of the "mains" rheostat button. Incidentally, its speed can reach 80 kilometers per hour.

Electric power transmission lines, cars and cables--is not everything too complicated? Perhaps it is better to return to the old, tested models that conquered air space at the turn of the century?

Regardless of how strange, being linked to the earth by cables, the dirigible of the Ufa workers "untied its hands." A paradox? In no way.

"The disadvantage of the zeppelins equipped with an internal combustion engine," says G. I. Vasil'yev, "was their low efficiency. One-fourth of the lift goes to fuel. As the fuel burns, the dirigible, since it is lighter than air, tries to rise. This means that the volume of the shell must be reduced and gas must be released to hold it in horizontal flight. Our dirigible is devoid of this deficiency. It is raised and lowered by increasing or decreasing the length of the attaching cables. Most accidents of zeppelins occurred during launch, when descending air flows snatched them up and forcefully threw them against the hard ground. This cannot happen with our transport system--its lift is always in excess."

And now calculate. The craft designed by the Kiev Public Design Office of Dirigible Construction requires about 5,500 tons of fuel annually. We did not consume one drop. Of course, our dirigible hauls 5,500 tons more cargo. As you can see, an electric dirigible is both more economical and more reliable.

Specialists of Bashkirenergo have calculated that erection of one kilometer of LEP [Electric power transmission lines] in Siberia would cost 20,000 rubles. The same section of paved highway would cost one million rubles. There is also a large saving here.

According to our calculations, the 600-kilometer route over which the 10 cargo dirigibles will ply will cost approximately 16 million rubles. But this is almost one-fortieth as much as expenditures for construction of an ordinary highway. Also calculate that an LEP will supply energy to the cities and settlements located on the route.

According to the developers, the main function of an electric dirigible is to deliver cargo to the difficultly accessible regions of Siberia and the Far East. It can also irrigate fields. Specialists of other sectors are apparently also interested in the innovation.

The idea of the Ufa workers is very original. Experts of the USSR State Committee on Inventions and Discoveries were unable to find analogs to the electric dirigible either in the USSR or abroad. Now a word about the design offices which would be able to bring the design to an experimental model. I would like to emphasize that all the parts of the flight vehicle, beginning with the shell and ending with the LEP poles, is being mass produced by industry.

Several photographs on which G. I. Vasil'yev has drawn dirigibles similar to flying saucers hanging above electric power transmission lines hang in the laboratory along with the graphs and calculations. And who is to know that perhaps even in the near future these pictures, now seemingly from the pages of science fiction collections, will become ordinary reality.

AIR

FUEL ECONOMY, REDUCTION OF CRUISING SPEED DEBATED

Moscow VOZDUSHNYY TRANSPORT in Russian 14 Feb 81 p 3

[Article by V. Kotochigov, junior scientific worker of State Scientific Research Institute of Civil Aviation: "The Further the Flight, the Greater the Saving"]

[Text] In the article "Optimum Conditions for Each Flight," published in VOZDUSHNYY TRANSPORT, 31 January 1981, V. Ksendzik, a navigator from Krasnovodsk, doubts the capability of saving fuel while reducing the cruising speeds of mainline aircraft. The reason that the author of the article developed unexpected conclusions about an increase of fuel consumption with a decrease of flight speeds is hidden in too free handling of numbers. He took the average figures of hourly fuel consumption for his calculations and the increase of flying time was taken as maximum from the indicated range.

Since the capability and efficiency of fuel economy by reducing cruising speeds is doubted, let us turn to more accurate calculations which every navigator can make. Assume that a Tu-134 aircraft completes a flight at Mach 0.8 (as was previously recommended) at an altitude of 10,200 meters. Based on data of the handbook for flight operation, one can determine that the specific range with average flight weight of 42 tons comprises 0.306 kilometers per kilogram. During flight under the same conditions at Mach 0.75, the specific range comprises 0.330 kilometers per kilogram. If the cruising range is equal to 600 kilometers, the difference in fuel consumption comprises 143 kilograms in cruising mode. And the longer the flight range, the higher the saving due to a reduction of speed will be.

The author of the indicated article writes correctly that the amount of air navigation fuel reserve, according to the instructions of NPP [Flight manual] GA-78, is selected by the ship commander in each specific case. But at the same time there are also recommendations on selection of the required amount of fuel. And if the crew does not ask him and pours in an amount of fuel several tons more exceeding the justified amount, then this most frequently indicates only a careless attitude toward an important state matter.

A few words about accounting for expended fuel. We quite agree that calculation of fuel consumption norms according to actual time, introduced by the Ministry of Civil Aviation in 1980, does not contribute to effective conditions of conservation. However, this system was introduced only last year and the fuel consumption norm should now be calculated by the corresponding to the 1981 schedule.

It is undoubtedly correct that each navigator and each flight navigation section should carefully approach calculation of the most advantageous conditions for each voyage and for each flight. Specialists of the State Scientific Research Institute of Civil Aviation have prepared differentiated recommendations on the most advantageous conditions for three main types of mainline aircraft--the Il-62, the Tu-154 and Tu-134--to assist the flight staff as a function of flight weight and cruising altitude with regard to wind conditions. The numerous comments of the flight staff were also taken into account in them. It is felt that they will contribute to solution of the fuel conservation problem by each crew.

6521

CSO: 1829 /206

AIR

PLANS FOR CIVIL AVIATION DEVELOPMENT IN KRASNOYARSKIY KRAY

Moscow VOZDUSHNYY TRANSPORT in Russian 12 Feb 81 p 1

[Article by P. Sorokin: "An Aviation 10-Year Plan for Krasnoyarskiy Kray"]

[Text] During the days before the 26th Party Congress, the office of Krasnoyarsk Party Kray Committee reviewed measures on accelerated development of civil aviation in the kray during the 11th Five-Year Plan and for the period to 1990. The Deputy Minister of Civil Aviation L. Svechnikov and the managers of a number of local party and Soviet bodies and construction and installation organizations participated in the work of the office.

In a brief report, the chief of the Krasnoyarsk Administration of Civil Aviation A. Khalin said that all tasks of the previous five-year plan were mainly fulfilled in advance of the planned deadline. Fourfold more funds were assimilated in capital construction and reconstruction of airports in the Arctic and ninefold more funds were assimilated in development of local aviation routes alone than during the Ninth Five-Year Plan. Seven airports were redesigned to accept heavy Il-76 and Tu-154 aircraft and more than 20 airports were reconstructed to accept YaK-40 and An-24 aircraft. Supplementation of the aviation enterprises with new equipment and assimilation of it were continued intensively. The total length of air lines was increased by tens of thousands of kilometers.

It was noted at a meeting of the office that the vigorously growing needs of the populace and the national economy for air shipments are not being fully met. Therefore, development of civil aviation in the kray should proceed at even more accelerated rates.

Thus, the volumes of work should increase by 60 percent in transport shipments and by an average of 70 percent in the use of aviation in the national economy. The ministry plans increased deliveries of Il-62, YaK-42, Tu-154, Il-76, An-28 and L-410 aircraft to the administration for successful solution of such complex tasks. This equipment can be utilized with high productivity only if there is even broader organization of capital construction.

Not only runways should be constructed (as was necessary during previous years), but all the necessary structures in the complex--air terminals, hotels, aviation engineering bases, GSM [Fuel and lubricants] depots, apartment buildings, schools, kindergartens and cultural and service facilities for aviators--had to be constructed.

The kraykom office discussed in detail this extensive program for development of a network of airports on major and local air lines and noted that fulfillment of it requires the maximum efficient utilization of the allocated funds and clearly organized interaction of all responsible and interested agencies. A suggestion that the Ministry of Civil Aviation devote considerably more attention in planning of capital construction to the sociocultural and service facilities at aviation enterprises was specifically advanced. Specific measures and deadlines for implementation of the program of aviation development of the kray were noted by a resolution of the office.

"We are pledged to achieve unconditional fulfillment of the planned program since fulfillment of the 10-year plan for complex development of the productive forces of the kray makes no sense without accelerated development of civil aviation," emphasized the first secretary of the kraykom of the party P. Fedirko in conclusion.

6521

CSO: 1829/206

RAILROAD

GRAIN SHIPPING PRACTICES CRITICIZED

Tallinn SOVETSKAYA ESTONIYA in Russian 12 Feb 81 p 2

/Article by members of the raid team: G. Buzin, chief of staff of the Komsomol'skiy Prozhektor of the Estonian Maritime Shipping Agency; V. Yegorov, temporary inspector of the Estonian SSR Peoples' Control Committee; V. Moskvina, inspector of the Estonian SSR Peoples' Control Committee; A. Stolyarov, deputy chairman of the republic headquarters of Komsomol'skiy prozhektor: "Reserves in the Transportation Chain: Hold - Railcar - Warehouse"7

/Text7 At the 13th Congress of the Estonian Communist Party it was noted that transport, especially railroad transport, is a "bottle-neck" in the republic's economy. For this reason, questions having to do with putting available reserves into use are quite pressing. The joint raid /unannounced inspection7 of the Estonian SSR Peoples' Control Committee and the Estonian Komsomol'skiy prozhektor headquarters confirms this assertion in specific examples noted in January. This time the raid team limited its investigation to the loading and unloading operations and the transport of grain products.

The Ship Reaches the Port...

The purpose of the raid was to check the transportation chain: the ship's hold - the railcar - the warehouse of the cargo recipient. The members of the raid team investigated this chain in January, from almost the very first days of the new year.

Our narration could commence with how the ship, the TINA, stood idle in the Tallinn sea port for 26 hours while waiting for railcars. But, alas, this is a very common fact. Therefore, let us take another example. On 11 January in the port they began unloading the K. KORSHUNOV, which belongs to the Arkhangel'sk Maritime Shipping Agency. This ship was "lucky" - railcars were immediately available. And the weather was good. The wheat was unloaded without delays. By noon the next day the ship was completely processed. Then the raid team members went down into the ship's hold, where in one hold they found approximately 150 to 200 kilograms of wheat. How did this happen? It turns out that no one from the ship's crew bothered to open the hatch. The dockers cleaned

out the hold and went to work in another. They opened the unlucky hatch cover and grain spilled onto the floor of the hold that they had just cleaned. Following a "skirmish" between the sailors and the dockers, the rest of the wheat was unloaded.

Out of 1,950 tons of wheat 150-200 kilograms are only a handful, a small amount. But let us remind you that many ships arrive and the inspectors cannot point their finger at the centners of abandoned wheat from the shore. By the way, in any good kholkhoz they strictly account for every "forgotten" sack of grain.

While leaving the ship, we notice two new pneumatic devices for transferring grain from the holds to railroad cars. Their counters show a pathetic "3" and "5". This is the number of hours that these devices have been operated over a three-month period.

In a talk with the brigade leader of the dockers, I. Petraytis, we find out about his attitude toward the new equipment. "In productivity the equipment is inferior to the grab crane. It is good in bad weather, when other loading methods cannot be used. However, the instructions for operating the new equipment have not been developed. We made an effort to use the pneumatic devices once or twice, but then we gave up on them."

As we leave the port, just outside the gates we see two bags of corn. Why are they here? Neither the watchman at the gate nor the chief of port security, M. Shabalin, could answer this questions. We return the bags of corn, which belonged to "no one", to the port. Once again, some may consider this fact a trifling matter.

The railcars, loaded with grain from the K. KORSHUNOV, must be weighed. The operation gets underway 45 minutes late, but in accordance with all rules - with the uncoupling of the railcars. The train marshaller clearly does not like working in front of strangers. The machine operator takes several tries to put the railcar in position for weighing. One would not know that they perform this same procedure every day here.

Riddles Requiring Clarification...

The members of the raid team hurried to the city of Keyla. And, as the reader will be convinced, their haste was in vain since the railcars move extremely slowly from the Tallinn port to the Keyla grain products combine. It takes 48 hours to cover 29 kilometers. It took this long for a train loaded with grain from the ship, SOVETSKIY VOIN. But let us be precise. Some of the railcars that we monitored were again "lucky". Out of 12 cars 4 reached Keyla by the next day, 7 on the second day, and the remaining railcar stood idle somewhere for yet another day. We ask the Estonian division of the Baltic Railroad to do the homework on the speed of transporting the grain.

We were also astounded by other strange things. Not only with the weight of the wheat but also the weight of the railcars. Out of 12 empty railcars provided for unloading the K. KORSHUNOV in Tallinn, only

three cars registered the same weight. On the Keyla scales 5 cars weighed more than in Tallinn and 3 less than at the port. In a word, half of the railcars had a weight difference of between 200 and 650 kilograms. Empty railcar No. 2665217 even weighed 750 kilograms more in the Tallinn port than it did in Keyla.

The weighing of the loaded cars in Keyla is accompanied by similar strange events. On the train that we checked for some reason the railcars weigh 50 kilograms more, except for one car which contained 650 kilograms more wheat than at the port.

On another train, railcar No. 2738275 carried 10 tons 250 kilograms more wheat to Keyla than was shipped from Tallinn.

The raid team members were unable to solve this problem, which was by now more than a homework assignment. But one thing is clear - the transportation workers have a careless attitude toward the weighing of freight. Let us cite one more scandalous figure. Last year alone the weight difference in grain unloaded at the Tallinn port when weighed on railroad scales was more than 3,000 tons. From this grain it would have been possible to grind 2,888 tons of first-class flour. It is advantageous for the railroad workers to have this "added weight"! For it is they who are responsible for the preservation of the grain in the railcars and who put the lead seals on them. An enormous amount of grain is either not delivered to the grain combines or is not accounted for. And, as is known, there are those who have no conscience and who have sticky fingers. In both cases, the state is the loser.

Pathetic Statistics...

The State Grain Inspectorate formally accepts railcars loaded with grain. This operation is also done at the Tallinn railcar depot. From 5 through 12 January, the depot released 259 railcars, of which the grain inspectorate found 50 to be unserviceable. This included 20 cars that needed repair. The remaining 30 railcars had traces of chemicals, broken glass, and other pollutants in them. These pathetic statistics could be called a chronic disease of Soviet railroad workers. The roots of the problem can be found in poor economic management and a lack of responsibility.

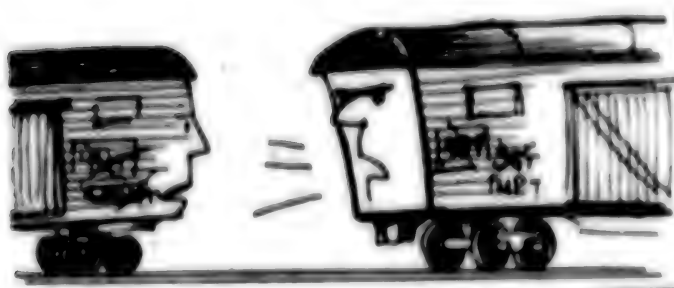
During the raid this event was also recorded. On 11 January, railcar No. 2597865 was loaded with wheat and sent to the scales. It was bumped hard and a side wall of the car fell apart. More than a ton of grain fell to the ground. An investigation revealed that the railcar had been in disrepair. The railcar dept bore the losses. But some of the grain was still lost. Here is an even more scandalous event. A leakage of barley was detected in railcar No. 2597185. The port workers had not installed the grain shields. So some of the barley was thrown into a hole at the port and covered up with trash for concealment. The total losses in these two incidents alone were 1.6 tons of grain.

The raid participants have not wished to dramatize the situation. But there is no way to avoid the facts, - the transport chain is too often broken when carrying grain products. And the totally unwarranted losses are great.

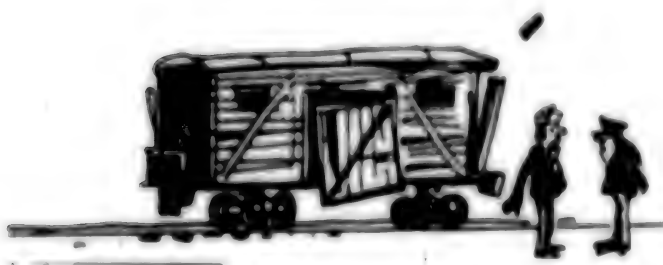
CARTOONS



Shouldn't we set up a poultry farm here in the port?



Just between you and me, speaking as railroad cars, I have no idea how much I weigh.



Don't let this railroad car leave the hump. It will fall apart!

RAILROAD

FINNISH PRESS: CAR SHORTAGE TO WORSEN IN COMING YEAR

Helsinki HELSINGIN SANOMAT in Finnish 21 Mar 61 p 23

[Article: "Continuing Shortage of Soviet Railroad Cars"]

[Text] The shortage of Soviet-made covered railroad cars, which has hindered Finnish exports to the Soviet Union for a long time already, will worsen this year. On the basis of developments in the first part of the year it seems that the Soviet Union will be able to deliver 60-70 percent of the agreed upon number of railroad cars.

This deficit is causing the most concern to the Finnish forest products industry, which fears the situation will become especially difficult by summer since there is already now a crying shortage of rolling stock. In previous winters there have been a sufficient number of railroad cars, the shortages did not occur until fall.

According to the statistics of the State Railways 1,000 fewer covered railroad cars were delivered to Finland than stipulated by the agreement. In the commodity exchange negotiations between Finland and the Soviet Union for the current year it was decided that 63,000 covered railroad cars would be delivered to Finland. If developments continue at the current rate, the total amount for the year will reach only 40,000 railroad cars.

One of the reasons for this year's difficult situation is that a portion of last year's deliveries was postponed until January and an attempt was made to make up the old deficit.

Suffering the most from this shortage of railroad cars is the Finnish forest industry, which uses three-fifths of the Soviet rolling stock.

Director Magnus Wangel of the Wilh. Schauman Corporation's Pietarsaari Plant states that at this time the shortage is glaring and chronic.

"We need 110 railroad cars immediately, of which 90 would be used for transporting paper sacks and the remainder for paper," states Wangel.

"Transport difficulties are causing significant extraordinary expenditures for storage. We have calculated that the cost of double storage is 70 markkas per ton. Last year monetary losses were more than a half million markkas," states Wangel.

The manner in which the railroad cars are brought to the plant is also causing difficulties. "An extremely large number is delivered at one time, at which time they must be loaded quickly at the expense of overtime,"

Paper Products Director Juha Niemela of the Valkeakoski Amalgamated Paper Plants states that all the warehouses are now full "and storage in improbable places is about to begin."

The number of cars needed for paper products is 154 since daily production is 15 loads.

"Generally the situation is good in the winter time so that we are now fearful of what to expect in the future," states Niemela.

The Amalgamated Paper Plants have attempted to overcome these difficulties by transporting in open cars. However, this method can be used for only one product, plastic cellulose."

Conditions of Soviet Railroad Cars Has Improved

A solution to the shortage of railroad cars has also been sought in Finland. The State Railways has studied the possibility of increasing the use of open railroad cars, but increased packaging costs primarily have been an obstacle to this.

Finnish-made covered railway cars have been offered for Soviet use, but they have not been approved for technical reasons.

In recent years the condition of Soviet railroad cars has also improved so that repair work has been kept to a minimum. Previously there were even holes in the bottom of the cars large enough for a man to fall through.

Railroad Car Shortage to Be Discussed During Karjalainen's Visit

The shortage of railroad cars will once again come up for discussion during the visit of Ahti Karjalainen, director of the Bank of Finland and chairman of the Finnish Delegation of the Finnish-Soviet Joint Commission, to the Soviet Union on Sunday.

During the combined 10-day working and vacation trip Karjalainen will meet with Soviet Foreign Trade Minister N. S. Patolichev, and the shortage of railroad cars will be one of the subjects of discussion.

"We will not be able to propose too much at these discussions. The purpose once again is to bring the attention of the Soviet side to this question," states Karjalainen.

Karjalainen does not believe that the shortage of railroad cars will be a retardant to trade between our countries. "Even though shortages do appear from time to time, over the long haul the exchange of commodities is progressing in accordance with the agreement."

10576

CSO: 3107

OCEAN AND RIVER

MARITIME FLEET MINISTER HOLDS PRESS CONFERENCE

Moscow MORSKOY FLOT in Russian No 1, Jan 81 pp 4-5

[Article reporting press conference held by T. B. Guzhenko, USSR minister of maritime fleet]

[Text] A press conference organized for Soviet and foreign journalists by the Press Division of the USSR Ministry of Foreign Affairs has been held at the Ministry of Maritime Fleet in Moscow.

T. B. Guzhenko, USSR minister of maritime fleet, spoke to the journalists about industry's development over the period of the 10th Five-Year Plan: 1975-1980.

The minister noted that the Soviet Union is developing a maritime merchant fleet on the basis of its needs for domestic and foreign shipping. In the years of the 5-year plan new vessels were obtained with a total deadweight tonnage of about 4.26 million tons. Ship design and construction are taking into account recent achievements of scientific-technical progress. The fleet is continuing to receive vessels in progressive series that ensure application of new technology, which in turn reduces the time required for cargo-handling operations.

Vessels which have gone into service include the LASH vessels "Yulius Fuchik" and "Tibor Samueli," large ro-ro vessels in the "Magnitogorsk," "Kapitan Smirnov," and "Skul'ptor Konenkov" series, the gas carriers "Mossovet" and "Smol'nyy," seatrains in the "Geroi Shipki" and "Sakhalin" series, specialized vessels for carrying particularly heavy cargo in the "Stakhanovets Kotov" series. The fleet has been replenished by series of general-purpose dry-cargo vessels, container carriers of varying capacity, bulk carriers in various series, including those with 100,000-ton capacity, tankers of varying tonnage, including those in the "Krym" series with a carrying capacity of 150,000 tons. But the Soviet merchant fleet is not ordering the very large tankers. In view of the character of the country's foreign economic relations, Soviet shipping companies are mainly ordering tankers with a deadweight tonnage of 20,000-40,000 tons.

In view of the country's geographic position, the large number of seas, bays, straits and rivers which freeze, we are regularly receiving new icebreakers and vessels in the ice class. Groups of arctic bulk and container carriers in the "Dmitriy Donskoy" series and of icebreaking tankers in the "Samotlor" series have

been built, and the multipurpose prototype vessel "Vavchuga" to operate in the shallow waters of seas which freeze has gone into service.

Tens of millions of tons of cargo of the national economy are being carried every year by the Soviet maritime fleet in domestic traffic. It has particularly great importance to the regions of the Far North, Siberia, and the Far East, where intensive development of natural resources has begun in accordance with the country's 5-year plans. In those regions the maritime fleet is at times not only the basic form of transportation, but the only form.

With the help of powerful icebreakers, including the three nuclear giants "Lenin," "Arktika," and "Sibir'," the western section of the Northern Sea Route from Murmansk to Dudinka has been turned into a trunk line in constant operation. For the first time in the history of arctic cruises merchant vessels have succeeded in making winter trips to points on the country's northern shore, where they unloaded the equipment being delivered directly onto the ice.

The historic trip of the nuclear vessel "Arktika" to the North Pole in 1977 and the high-latitude crossing of the Arctic Ocean from west to east by the merchant cargo vessel "Kapitan Myshevskiy" led by the nuclear vessel "Sibir'" in 1978 have tremendous importance to further development of regular navigation in icy northern waters.

The USSR's merchant fleet has brought the present 5-year plan, like previous ones, to a successful conclusion. This largely resulted from the fact that the industry has highly qualified specialists. A well-ordered system has been set up for training maritime personnel; it has been recognized as one of the best in the world. We need to emphasize, T. B. Guzhenko, that the system of personnel training through vocational schools, regular schools, courses, and schools for improvement of qualifications of specialists has been worked out for all levels--from the seaman to the minister.

Traffic between the ports of the Soviet Union and the socialist countries has become especially important in the years of the 10th Five-Year Plan. Soviet seamen have delivered a large volume of cargo to the fraternal peoples of Cuba, Vietnam and Campuchea.

On the basis of the Comprehensive Program for Further Extension and Improvement of Cooperation and Development of Socialist Economic Integration of CEMA Member Countries, which is in effect, contacts are also expanding in the field of maritime transport of the socialist countries.

Progressive transport systems have been introduced on an equal and mutually advantageous basis. The ferry between Il'ichevsk and Varna has been operating successfully; it solves a great number of problems related to trade between the USSR and Bulgaria. The international shipping enterprise "Interlikhter," of which Bulgaria, Hungary, the USSR and Czechoslovakia were the founders, has been operating at a profit. The joint Soviet-Bulgarian company "Dunaytrans," which regulates operation of the fleet on the Danube, has been very effective. That same fleet is now carrying nearly a third more cargo.

The Soviet merchant fleet is an active participant in carrying the country's exports and imports, safeguarding the independence of the USSR's foreign trade from foreign shipping companies. Vessels under the flag of the Soviet Union annually call at 1,140 ports in more than 120 countries on all continents.

In speaking about the foreign economic activity of the Soviet fleet, we cannot but mention the present situation on the seas and oceans. For several years now international shipping has been in a state of the deepest depression because of the latest economic crisis in the countries of the capitalist world.

The shipowners of the advanced capitalist countries are trying not only to win out in the competitive struggle, but also to maintain their dominant position in world traffic. To that end they use economic pressure and political protectionism. The Soviet merchant fleet is also subject to strong pressure. They attribute to us "unjustifiably rapid" growth of tonnage, they accuse us of "dumping," of "expansionism," and of "aggression." Under a smokescreen of anticommunism they push forward discriminatory decisions directed against the shipping companies of the countries of the socialist commonwealth.

We will strive to develop cooperation with the capitalist countries. And we know that a mutually acceptable solution can always be found. Even self-restraint can be undertaken along certain lines.

But, the minister stressed, we are not afraid of boycotts. In 1980, for example, the fleet fulfilled its plans better than in the past year, before the boycott declared by Carter. The positions of the Soviet merchant fleet are stable. Our planned economy has a sizable reserve and substantial capabilities. That is why the USSR's maritime transport is successfully completing the planning assignments of the 10th Five-Year Plan. Socialist cooperation of work collectives in the industry will broaden and become stronger for a worthy greetings to the 26th CPSU Congress.

In conclusion the minister T. B. Guzhenko answered the questions of the journalist.

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OCEAN AND RIVER

CARGO FLEET OF USSR, OTHER CEMA MEMBER COUNTRIES

Moscow MORSKOY FLOT in Russian No 1, Jan 81 pp 52-53

[Text] The CEMA Bureau for Coordination of Ship Chartering issued in 1980 the regular statistical summary on the maritime merchant fleet of the CEMA member countries (except the Socialist Republic of Vietnam) as of 31 December 1979. It was compiled on the basis of information obtained from the maritime shipping companies of the People's Republic of Bulgaria, the Hungarian People's Republic, the German Democratic Republic, the Republic of Cuba, the Polish People's Republic, the Socialist Republic of Romania, the Union of Soviet Socialist Republics and the Czechoslovak Socialist Republic. The summary includes only data on the maritime cargo fleet, and includes vessels which have a gross registered tonnage of at least 100 tons (not including merchant vessels serving the fishing industry or passenger vessels).

It is evident from Table 1 that in 1979 the merchant fleet of the CEMA member countries had a total deadweight tonnage of about 30.5 million tons and gross registered tonnage of 20.9 million tons.

According to the data of Lloyd's Register, the total gross registered tonnage of the world merchant fleet as of mid-1979 was 413 million tons, 27.2 million tons of which pertained to vessels not participating in merchant shipping. Thus the gross registered tonnage of the merchant cargo fleet of the CEMA member countries comprised about 5.4 percent of the world merchant fleet. In a year the fleet of the CEMA member countries increased by 695,000 gross registered tons or 897,000 deadweight tons (MORSKOY FLOT, No 1, 1980). The share of the tanker fleet, including gas carriers and chemical carriers, had a share of 27.5 percent, as against 29.0 percent in 1978.

Over the 5-year period 1975-1979 (Table 2) the deadweight tonnage of the merchant cargo fleet of the CEMA member countries grew by 6.6 million tons, or 27.7 percent. In that period Romania's fleet was developing at a fast pace, more than doubling the deadweight tonnage in 1975. The fleets of Cuba, Hungary and Bulgaria also grew considerably. The deadweight tonnage of the Soviet Union grew by 3,878,000 tons over the 5-year period.

According to data of the USSR Register (MORSKOY FLOT, No 5, 1980), the gross registered tonnage of all Soviet maritime vessels (100 tons or more) as of 1 January

1980 was 21,891,000 tons. Consequently, the gross registered tonnage of the merchant cargo fleet was 60.4 percent of the total gross registered tonnage of the USSR's maritime fleet.

The statistical summary of the CEMA Bureau for Coordination of Ship Chartering gives detailed data on the composition of the fleet of each shipping company of the CEMA member countries. In the Soviet Union (Table 3) the Novorossiysk Shipping Company has the highest deadweight tonnage; it exceeds 5.2 million tons, 970,000 tons of which consist of combined vessels--serving both as bulk carriers and tankers, and the rest of tankers.

The largest dry-cargo shipping enterprises in the USSR are the Black Sea, Far East and Baltic shipping companies, whose share is about 7.3 million tons of the merchant cargo fleet's entire deadweight tonnage (about 39 percent). In all the Soviet merchant fleet numbered 1,713 vessels by the beginning of 1980, with a total deadweight tonnage of 18,876,000 tons and gross registered tonnage of 13,232,000 tons. It occupies first place among the fleets of the CEMA member countries and comprises 61.8 percent of their total deadweight tonnage.

Table 1. Merchant Cargo Fleet of the USSR and Other CEMA Member Countries as of 31 December 1979

Vessel Type	Fleet of CEMA Member Countries			Fleet of Soviet Union		
	No of Vessels	Gross Registered Tonnage, thousands of tons	Deadweight Tonnage, thousands of tons	No of Vessels	Gross Registered Tonnage, thousands of tons	Deadweight Tonnage, thousands of tons
Cargo fleet--total	2,614	20,865	30,519	1,713	13,232	18,876
Breakdown:						
Combined vessels--vessels carrying liquid and bulk cargoes	13	655	1,124	10	600	1,039
Tanker fleet	386	5,745	9,133	328	4,285	6,555
Gas carriers alone	9	111	117	9	111	117
Chemical carriers alone	7	32	44	--	--	--
Dry cargo fleet	2,215	14,465	20,262	1,375	8,347	11,282
Bulk carriers alone	301	4,244	6,680	110	1,264	1,964

Table 1 (continued)

Vessel Type	Fleet of CEMA Member Countries			Fleet of Soviet Union		
	No of Vessels	Gross Registered Tonnage, thousands of tons	Deadweight Tonnage, thousands of tons	No of Vessels	Gross Registered Tonnage, thousands of tons	Deadweight Tonnage, thousands of tons
Refrigerated vessels alone	49	242	245	31	167	153
Container carriers alone	98	643	727	49	370	382
Ro-ro vessels alone	44	251	325	38	236	301
Sea ferries alone	34	167	92	20	99	54
Lighter-carriers alone	2	72	76	2	72	76

Table 2. Deadweight Tonnage of the Cargo Fleet of the CEMA Member Countries in the Period 1975-1979, thousands of tons

Country	1975			1979		
	Total	Dry-Cargo Fleet	Liquid-Cargo Fleet*	Total	Dry-Cargo Fleet	Liquid-Cargo Fleet*
Bulgaria	1,163	717	446	1,573	1,066	507
Hungary	72	72	--	98	98	--
GDR	1,793	1,186	607	1,898	1,403	495
Cuba	558	495	63	935	842	93
Poland	3,876	2,864	1,012	4,336	3,355	981
Romania	1,213	771	442	2,570	1,983	587
Soviet Union	14,997	9,693	5,304	18,876	11,282	7,594
Czechoslovakia	224	224	--	233	233	--
Total	23,897	16,023	7,874	30,519	20,262	10,257
Share in Deadweight Tonnage of CEMA Member Countries in 1979, %			Growth of Deadweight Tonnage Over 1975-1979 Period			
			Thousands of Tons		%	
Bulgaria	5.1		410		35.2	
Hungary	0.4		26		36.1	
GDR	6.2		105		5.8	

* Including combined bulk-liquid-cargo vessels.

Table 2 (continued)

Country	Share in Deadweight Tonnage of CEMA Member Countries in 1979, %	Growth of Deadweight Tonnage Over 1975-1979 Period	
		Thousands of Tons	%
Cuba	3.0	377	67.6
Poland	14.2	460	11.8
Romania	8.4	1,357	111.9
Soviet Union	61.9	3,878	25.8
Czechoslovakia	0.8	9	4.0
Total	100.0	6,622	27.7

Table 3. Distribution of the Merchant Cargo Fleet of the USSR Among Maritime Shipping Companies (as of 31 December 1979)

Shipping Company	Entire Fleet			Tanker Fleet			Dry-Cargo Fleet			Bulk-Liquid-Cargo Vessels		
	NUMBER OF VESSELS (1)	GROSS REGISTERED TONNAGE, THOUS. TONS (2)	DEADWEIGHT TONNAGE, THOUS. TONS (3)	NUMBER OF VESSELS	GROSS REGISTERED TONNAGE, THOUS. TONS	DEADWEIGHT TONNAGE, THOUS. TONS	NUMBER OF VESSELS	GROSS REGISTERED TONNAGE, THOUS. TONS	DEADWEIGHT TONNAGE, THOUS. TONS	NUMBER OF VESSELS	GROSS REGISTERED TONNAGE, THOUS. TONS	DEADWEIGHT TONNAGE, THOUS. TONS
Azov	121	544 224	717 069	1	1 754	1 660	120	542 470	715 409	—	—	—
Baltic	162	1 140 295	1 587 306	—	—	—	162	1 140 295	1 587 306	—	—	—
Georgian	52	545 770	824 784	40	327 078	479 738	12	218 692	345 546	—	—	—
Far East	245	1 535 523	1 977 518	—	—	—	245	1 535 523	1 977 518	—	—	—
Kamchatka	49	151 018	191 385	4	6 420	6 325	45	144 598	185 060	—	—	—
Caspian	76	313 599	351 717	39	167 229	214 885	37	146 370	136 832	—	—	—
Latvian	108	958 940	1 297 440	61	779 295	1 104 925	47	179 645	192 492	—	—	—
Lithuanian	38	133 291	179 005	—	—	—	38	133 291	179 005	—	—	—
Murmansk	61	416 136	588 937	—	—	—	61	416 136	588 937	—	—	—
Novorossiysk	134	3 200 647	5 205 713	125	2 638 617	4 231 181	—	—	—	9	562 030	974 532
Primorskoye	55	359 605	511 555	55	359 605	511 555	—	—	—	—	—	—
Sakhalin	72	278 502	335 194	—	—	—	72	278 502	335 194	—	—	—
Northern	148	573 345	805 674	3	5 118	4 980	145	568 227	800 694	—	—	—
Soviet Danube	62	235 943	275 594	—	—	—	62	235 943	275 594	—	—	—
Black Sea	243	2 599 399	3 724 091	—	—	—	242	2 561 607	3 659 758	1	37 792	64 333
Estonian	87	245 787	302 825	—	—	—	87	245 787	302 825	—	—	—
Total	1713	13 232 024	18 875 811	328	4 285 116	6 554 776	1375	8 347 086	11 282 170	10	599 822	1 038 865

Key: 1. Number of vessels
 2. Gross registered tonnage, tons
 3. Deadweight tonnage, tons

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OCEAN AND RIVER

CARGO SHIPMENTS BETWEEN USSR, LIBYA

Moscow VODNYY TRANSPORT in Russian 24 Mar 81 p 1

[Article by Yu. Lukasik, special correspondent: "Line Service Maintained by Ro-Ro Vessels"]

[Text] The Berdyansk--Misurata (Libya) line is being maintained by three vessels of the Sea of Azov Shipping Company. The goods of Soviet foreign trade associations are traveling in one direction, and empty containers and ro-ro trailers in the other. A distinctive feature of the line is that the crews themselves unload the vessels in Misurata. This has been set forth in the relevant contracts.

This peculiarity requires of the seamen the ability to drive buses, truck tractors, lift trucks, excavators and farm tractors--practically any equipment. In other words, they need to be drivers who can drive anything. On all the shipping company's ro-ro vessels a vigorous process of training seamen to drive a wide variety of equipment has been going on since these vessels were received from the shipyard--in the middle of the seventies. It is no accident that most of their crew members have qualified as longshoreman machine operators.

Nor is the crew of the ro-ro vessel "Akademik Artsimovich," one of the diesel vessels operating on the Berdyansk--Misurata line, an exception in this regard. Yet it is still not possible to learn to drive the entire range of different equipment. There is always the demand, therefore, for resourceful people who can quickly learn to drive an unfamiliar vehicle.

Among the cargo which the motor vessel delivered to Misurata on the last trip was a cutter-wheel trencher. There was a hangup in the unloading operation: the motor would not start. S. Shteyn and S. Vysotskiy, machinery electricians, determined the cause--the batteries had lost their charge. A. Shakhunov, ship's electrician, charged and replaced them. The motor started!

Then A. Shakhunov drove the excavator out of the hold. Of course, it is no accident that it was Anatoliy Fedorovich Shakhunov, a member of the party, who did it. He is one of those resourceful people so needed in the crews of ro-ro vessels. Many people have had basic theoretical training and therefore have a good idea that any crawler machine has a clutch, a gas lever, and so on. Wheeled equipment will have an accelerator pedal, a brake, and so on. The basic principle is

well-known and clear. But in practice the equipment is always different, and every time one must learn all over again. And there are no textbooks or manuals or specialists on the ship. That is when the Shakhunovs come to the rescue.

Of course, on the next trip all the complications have to be analyzed--the seamen learn from them. Many read specialized journals--this also helps considerably. Consequently, there are now more and more people in the fleet who can be referred to as equipment-operator seamen or longshoremen-seamen. And in future such specialists might be altogether capable of completely loading and unloading their vessels in ports of loading and ports of delivery.

To that end it is obvious that even today courses are needed for seamen to study the equipment they will be carrying. The question of supplemental remuneration is being put on the agenda--so far everything is being supported by people's enthusiasm. Of course, the seamen should also obtain the relevant certificate for this.

Here are some of the questions that have been raised by the operation of the "Akademik Artsimovich" on the Berdyansk--Misurata line. The crews of the vessels are not at all bound by precise dates of arrival in port. Rather it is a matter of the shipping company being required to send to Misurata a certain number of motor vessels each month.

"The navigation presents no particular problem for me, since I am an ice captain," says Valentin Petrovich Shevchenko, who is substituting as captain of the "Akademik Artsimovich." "Yet navigating a ship here is not easy. The vessel's rather high speed--16.5 knots, heavy traffic in the straits, in the Aegean Sea and in the Sea of Marmara make the trips more strenuous."

The "Akademik Artsimovich" maintains constant radio communication with the other vessels on the line. V. Shevchenko radios I. Kozlov, captain of the ro-ro vessel "Znamya Oktyabrya" from the Black Sea, asking him:

"How is the situation now in Misurata?"

"Don't hurry, we are unloading. The weather is bad, we cannot unload normally."

The "Akademik Artsimovich" cruised to Misurata at economical speed, conserving fuel. Later, when they were on courses that brought them together, I. Kozlov radioed:

"Valentin Petrovich, be mindful that there are 40 empty ro-ro trailers awaiting you. Take care that the papers are filled out for them."

"Thanks, Ivan Ivanovich, thank you, understood."

The seamen also have a duty to strive to return the empties on time to the Berdyansk Commercial Seaport, then there is less layover time in the Soviet port. On the last trip they were able to pick up the containers and ro-ro trailers on time.

The crew of the "Akademik Artsimovich" has been successful in fulfilling the socialist obligations it assumed. It is no accident that there are no outstanding complaints against this ship in the No 3 KhEGS [(?) cargo shipping traffic department], of which this ro-ro vessel is a part. Today the seamen, enthused by the decisions of the 26th CPSU Congress, are striving to respond with deeds to the concern of the party and government for development of the merchant marine.

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OCEAN AND RIVER

ECONOMIC EXPERIMENT IN SHIP REPAIR

Moscow VODNYI TRANSPORT in Russian 31 Mar 81 p 2

[Article by special correspondents V. Lavruk and Yu. Lukasik entitled: "The Main Goal is a Better Final Result"]

[Excerpts] At the Zhdanov ship repair plant, on the same production areas, without an increase in capital investment, and with almost the same number of workers, the introduction of a new system of indicators permitted the accomplishment of the following results: the repair of ships was significantly accelerated, the relative importance of the repair of the ships of the sector is being increased, and an important saving in ship-operating days was achieved for the fleet. The new system raises the interest of personnel in accelerating the repair of ships, in increasing, because of that, the useful time for fleet operations, and in the improvement thereby of the final results of the activity of maritime transport.

The System of Allowances and Discounts. There is a question about the existence of an indicator which would take into account the time and volume of ship repair, would compensate the losses of the enterprises in reducing repair time for the fleet, would not require the reorganization of accounting, and would be sufficiently simple and unified for all administrative levels. These requirements are met by a system of allowances and discounts on the operative volume indicator - the standardized cost of processing (NSO) in relation to the layover periods of ships under repair. The profit received by a plant from charging such allowances is, in effect, a part of the profit received by the fleet as result of the ahead-of-schedule release of a ship from repair. Correspondingly, the discount is compensation for the loss to the fleet because of delay of a ship in repair. Simply speaking, such a system compels a plant, to a significant degree, to work toward a better final result for the activity of the whole industry.

To test the new indicator, an experiment was carried out at the Zhdanov SRZ [Ship Repair Plant].

This enterprise was chosen because it had fulfilled the daily average norm for processing ships according to volume indicators for production appertaining to the basic group of ship repair plants of the Ministry of the Maritime Fleet; because it had a typically mixed program in which ship repair amounts to only two thirds

of the volume of production outside of reconstruction; and because it was not planned to introduce new capacity there.

With the permission of Gosplan USSR, the Ministry of the Maritime Fleet began the experiment on January 1st 1978.

According to the instructions of the MMF [Ministry of the Maritime Fleet], the allowances (and discounts) were calculated by multiplying the norms of daily average processing by the number of [24-hour] days in the reduction (or increase) of the duration of the layover of a ship in repair as compared with the standard layover and by the ministry's approved average cost per hour in NSO. For example, if the norm for daily average processing is 400 hours, then for each 24-hour reduction of a ship's layover period in repair, the allowance, taking into account the MMF's established average cost per hour of 2 ruble 50 kopeks, amounts to $400 \times 1 \times 2.5 = 1000$ rubles. The discount for each unnecessary 24-hour delay of a ship in repair also amounts to 1,000 rubles. It should be noted that since 1 April 1979, the average cost per hour of NSO used in computing allowances and discounts was reduced by the ministry from 2.5 to 2 rubles in connection with the significant reduction in fleet repair time achieved by the plant.

The allowances and discounts received by the plant were distributed among the shops in proportion to the work done taking into account timeliness, flaw detection, fulfillment of work schedules, and the level of shift work.

Special cases were established when the allowances and discounts were not applied for the plant as a whole.

During the experiment, all operative planning forms, annual and current documents, norms and standards including fund formation and award systems, were maintained.

The new indicators turned out to be applicable for all administrative levels including shops and sections. They were successfully entered into the existing ASU [Automated Control System] and they did not require reorganization of accounting. They were sufficiently simple for practical use.

Earlier, before the introduction of the allowance and discount system, failure to complete repair of an individual ship on time led only to the loss of bonuses for early completion. This had no effect on the general indicators of the plant's fulfillment of the plan. Now, delays of ships in repair directly effects a lowering of the performance indicators of all subdivisions and the plant as a whole. To exactly the same degree, an acceleration of repair guaranteed compensation of the losses generated even during work on a small number of ships.

It is true that the organization of work on a small number of ships - that is with a reduction of the number of ships being serviced simultaneously by the plant - unavoidably leads to a reduction in the number of work places. This, in turn, requires an increase in shift work. A change-over of the drydock shop to a continuous three shift schedule was carried out with the machine shop and other sections on two shifts.

As result, a coefficient of shift work equal to 1.4 was successfully achieved. An improvement in surveys for defects played a role. Earlier, the plant often had

not confined itself to the standardized period for this operation. Therefore, a technique was developed for separating it into calculated and technological defect surveys [?sic]. Production on orders for semifinished products of in-house manufacture (castings and forgings), which usually are held in check, began to be done sometimes without [first] fully dismantling the machinery [to verify the need], but proceeding from experience in the repair of such units. The [resulting] excess of these semifinished products was not large, and they were either retained for repair on such ships in the future or transferred to the ships for spares.

What Did the Experiment Show? The results of the three year experiment exceeded all expectations. On the same production areas, with practically the same number of workers, and without any capital investment, the repair periods for ships were reduced by 15%. If in 1977, before the beginning of the experiment, the enterprise had saved the fleet 37 ship-days, in 1978 it was 381, in 1979 - 338, and in 1980 - 384. Over the three years the fleet received more than 4 million additional tonnage-days.

Especially important in this is the fact that it was all achieved by the plant along with a rigid fulfillment of the monthly plan according to all the basic indicators approved for it as an industrial enterprise. The Zhdanov SRZ worked rhythmically, fulfilling ahead of schedule its assignments for the 10th Five-Year plan and during its final year.

For the Five-Year Plan the growth of production volume (without allowances for ahead-of-schedule completions) will amount to 28.2% and for ship repair, it will be 30.6%. The latter indicator will be achieved despite a practical lack of reserve capacity for ship repair at the plant and with only half of required number of piers according to the most rigid standards. This means that the acceleration of the fleet repairs was achieved thanks only to the system of allowances and discounts and without harm to the other aspects of enterprise activity.

If we are to speak about final results, it is necessary to emphasize that owing to the early discharge of ships from repair, the Azov Sea shipping company alone in all three years received from 300,000 to 350,000 rubles in additional profit each year. That is, the economic effectiveness of plant operation during the experiment amounted to more than a million rubles over the three years.

It must not be forgotten that the attitude of plant personnel toward the acceleration of ship repair was changed. Before, the enterprise leadership had been forced constantly to watch the fulfillment of the work schedule of each shop, using all forms of administrative persuasion. With the introduction of the new indicators the situation was significantly changed because of the heightened interest of the shops and sections in accelerating operations.

Cases became more frequent at the enterprise where shops, on their own initiative, borrowed work from each other if, because of an overload in one of them, there was a danger of incurring discounts on some ship. During a lagging of any shop, its leadership fell under the serious criticism of their staff.

Owing to the system of allowances and discounts, the time spent on production and dispatchers meetings was reduced and many questions began to be worked out at shop level. The role of the foremen was elevated.

Comparing the work of the Zhdanov SRZ with other enterprises, it is necessary to observe that its staff has now gone up to the level of advanced plants in the fulfillment of the daily average norm for processing. And it must be kept in mind that the Zhdanov plant has not been renovated.

A poll of engineers and technicians at this enterprise was conducted to elicit their opinion about the necessity of retaining the new system of accounting and the advisability of its use at other plants in the industry. Their opinion was unanimous - the experiment had turned out well.

Seamen also evaluated the work of the plant under the new method. A journal of testimonials is being kept at the SRZ in which the crews record their evaluations of the completion of the repairs of the motorships. Only the kindest words and wishes addressed to the enterprise are found in this journal.

And there is the final feature. The new indicator, the NSO with allowances and discounts for the time for the repair of ships, turned out not only to be effective but also convenient for use in all plant subdivisions along with complete retention of the customary industrial accounting.

The experiment at the Zhdanov SRZ, among other things, permits looking at the organization and economics of ship repair at all plants of the Ministry of the Maritime Fleet in a new way.

The Next Step is a Follow-up System. Not just once or twice in the orders of the Ministry of the Maritime Fleet has it been noted that the timely delivery of ships under repair to the shipping companies is not better than 50%. And this is based on the periods of availability for repairs declared by the shipping companies themselves. Such a practice has not come about by chance. It is objective because it is generated by the operational conditions of the fleet; namely, changing freight circumstances, navigation conditions, the multiplicity of assignments, and so on.

According to the regulations about the repair of ships, shipping companies pay penalties for interrupting the periods of availability of ships for repairs, thus compensating for the losses of the plants. But in practice, this has not been done for a long time. The enterprises do not impose penalty sanctions on their superior organizations, the shipping companies. However, no matter how, the plants get into a complex situation. The planned preparation of production is disrupted which compels them to find additional charges for work by accepting unplanned-for ships into repair, frequently from outside organizations and without proper preparation. Then, when the motorships that were planned for still come to the pier of the enterprise for repairs, the situation with the work load is radically changed. This has a negative effect on the time for releasing these ships for duty.

The Zhdanov experiment offers a way out of such a situation. There is talk about the creation at ship repair plants of a follow-up for the fleet system of planning which would continuously take into account the changing operating conditions of the fleet. The interests of the enterprises will be assured if their losses are compensated according to the same principle applied during the experiment; that is, not by penalty sanctions but on a clearly commercial basis at the expense of the fleet. In this case it will be possible to go still farther. The plant will begin

to strive to repair more quickly that ship which is more useful or necessary to the shipping company.

The optimum operating condition of the plants is calculated by the operative ASU system based on the norms approved by the ministry for the daily average processing for different types of ships. [The ASU] handles the ahead-of-schedule release of ships from repair as it would [a part of] the overall tonnage of the cargo ships. But because the fleet long ago introduced qualitative indicators (profit, net earnings), it is necessary to change the computer program. Priority must be given to the most profitable ships, or it must be given to ships for other reasons that are meaningful for the shipping companies. For example, if one proceeds not from tonnage but from profitableness, then one can in all operative conditions assure significant additional profit to the fleet.

By the way, profit is not always the decisive factor. Passenger ships, for example, are needed by the dates in the schedules, icebreakers for the ice campaign, and cargo ships for carrying out special assignments. Priority can also be given to them.

It should be noted that in some measure, preference is now given to individual ships at the insistence of the shipping companies. But, being done outside the system, this disrupts the rhythm of plant operations and will lead to a complication of its activity. And it can be done in a planned sequence.

In other words, the three year experiment at the Zhdanov SRZ opened up the opportunity to reexamine the determination of the efficiency of the operations of the plants in the field of ship repair. The reexamination must be carried out taking into account the overall results received by the fleet. Correspondingly, the system of planning the activity of ship repair enterprises must be changed.

The ships of a shipping company that are not delivered on time for repairs are operating and bringing in additional net earnings or profit. Such profit also is received when ship repairs are finished significantly ahead of schedule. But definite losses are incurred by the plants. Therefore, rightfully, and for the most part, perhaps, it will be economically justified if the fleet, in this case, takes upon itself a part of the plan for the plants. Let us say, judging by the data of the Zhdanov SRZ experiment, that on each 100,000 tonnage-days of ahead-of-time completion, the plant loses 29,000 rubles and 19,000 are profits. The income of the fleet from these 100,000 tonnage-days can be many times more.

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OCEAN AND RIVER

PAST PERFORMANCE, FUTURE TASKS REVIEWED

Moscow MORSKOY FLOT in Russian No 1, Jan 81 pp 2-3, 5

[Article by V. Nikolaychuk, deputy minister of maritime fleet: "Entering the New Five-Year Plan"]

[Text] The year 1980, the last year of the 10th Five-Year Plan, has ended. The Country of Soviets has entered a new 5-year period. For the work force in maritime transportation, as indeed for the entire Soviet people, this has been a year of a high surge of political and labor efforts, a year of selfless work to fulfill the planning targets for the year and for the 10th Five-Year Plan, a year of implementation of the historic decisions of the 25th CPSU Congress.

For instance, the plan for domestic cargo traffic was fulfilled at 100 percent, and for foreign traffic (on the basis of financial indicators, at a level of 102.5 percent, the plan for the volume of cargo-handling operations in seaports at 102.2 percent, the plan for output of ship repair plants in terms of standard value added at 100.5 percent, and the target for profit in all types of activity at 103.6 percent.

The target was met in domestic traffic for cargoes on the basic list: grain, coal, ore, fertilizer, chemicals, building materials, timber and metals.

Principal attention was paid to complete and punctual delivery of shipments to Arctic points, remote regions with limited navigation periods, Kamchatka, Magadan and Sakhalin. Work continued to expand further the traffic on the Northern Sea Route, to carry cargo earlier to Yamal Peninsula for the Ministry of Geology and the Ministry of Construction of Petroleum and Gas Industry Enterprises, and to carry the shipments of the Noril'sk Mining and Metallurgical Combine throughout the entire year by organizing year-round navigation to the port of Dudinka.

A number of measures have been taken in the enterprises of the maritime transport industry to increase the economic efficiency of the fleet's operation, to lengthen the operating period of vessels, to reduce repair time, and to achieve economical consumption of fuel and electric power. In 1980 1,663 vessels operated on a schedule of less frequent repairs and overhauls, rigid allowances were set on consumption of fuel and electric power, and a monitoring system was set up to enforce them. Conservation for the year (in terms of standard fuel) was at least 2.4

percent for fuel and 3.7 percent for electric power. More effective use was made of work time and work norm-setting was improved, financial motivation for the end results was enhanced, and progressive work methods were disseminated more widely.

The targets of the 10th Five-Year Plan were completed successfully. In the 1976-1980 period the industry developed in accordance with the main lines of development of the USSR national economy adopted by the 25th CPSU Congress and set forth in the 5-year plan.

Total deliveries of the merchant fleet exceeded 4.2 million deadweight tons over the 5 years. The fleet was mainly replenished with specialized and highly productive vessels of new types. Additions to the fleet included large-tonnage ro-ro vessels in the "Magnitogorsk," "Kapitan Smirnov," and "Skul'ptor Konenkov" series, container carriers with a capacity of 700 containers in the "Khodozhnik Sar'yan" series and with a capacity of 400 containers in the "Kapitan Sakharov" series, the unique seatrains with a capacity of 108 cars in the "Geroi Shipki" series, LASH vessels in the "Yulius Fuchik" series with a capacity of 26 lighters, each with a carrying capacity of 1,100 tons, bulk carriers in the "Dmitriy Donskoy" series with a deadweight tonnage of 19,000 tons for carrying cargo in the Arctic basin, products carriers in the "Komandarm Fed'ko" series with a deadweight tonnage of 25,000 tons, and passenger, service and auxiliary craft, and many other vessels. The ice-breaker fleet was replenished with the powerful nuclear icebreaker "Sibir'." By the beginning of 1981 the fleet numbered 1,743 vessels (taking into account the vessels retired) with a total deadweight tonnage exceeding 18 million tons.

The material and technical base of shore enterprises in the maritime shipping industry has also developed. In the years of the 10th Five-Year Plan docks were put into service with a total length of 8.4 km, and they are expected to handle 44.5 million tons of cargo per year, while ship repair yards added docks with a total length of 1.8 km and 82,000 square meters of space in production shops. At the Il'ichevsk SRZ (ship repair yard) a shop was built to produce 5,000 international standard containers per year.

At the Sheskhari petroleum harbor a deep-water petroleum pier went into service capable of taking tankers with a deadweight tonnage up to 250,000 tons, and in the Vostochnyy port a specialized coal-loading unit with an output of 5 million tons per year was put into service.

An international ferry linking our country to fraternal Bulgaria has been operating successfully since 1978. At the mouth of the Danube the first phase of a facility to serve LASH vessels has been built, and a new shop has been erected for construction of lighters at Kiliya. Container terminals have undergone further development in the Leningrad, Riga, Il'ichevsk, Vladivostok and Vostochnyy seaports.

The targets of the 10th Five-Year Plan on the basis of the estimated total of the annual plan were fulfilled at 101.4 percent for the domestic traffic carried by the merchant fleet and at 101.2 percent for foreign traffic. Financial indicators in the fleet's operation in foreign traffic increased 38 percent over 1975. The volume of cargo-handling operations in seaports reached 202 million tons in 1980 and grew 12.4 percent over 1975. The level of complete mechanization of cargo-handling

operations was 93.4 percent, as against the 92.6 percent envisaged by the 5-year plan.

The development of maritime transport in the 10th Five-Year Plan made it possible to satisfy more fully the national economy's need for traffic of domestic cargo and exports and imports, to ensure the independence of Soviet foreign trade from foreign shipping companies, to responsibly fulfill the government's assignments for carrying a sizable amount of grain, sugar, meat and pipe, and also to deliver various cargoes without interruption to the seaports of Cuba, Vietnam, Campuchia and the developing countries of Africa and Asia, averting the blockade imposed by certain states.

In the years of the 10th Five-Year Plan the fixed productive capital of the maritime transport industry grew 46 percent and amounted to about 15 billion rubles as of 1 January 1981.

The industry confronts large tasks in 1981. The requirements for the traffic of domestic and foreign cargo are increasing. The plan for 1981 provides that the total tonnage for all types of traffic will increase 1 percent, traffic in terms of tonnage and distance 2.5 percent, and financial indicators in operation of the fleet in foreign traffic--2.6 percent (not including the higher cargo shipping rates in international traffic that took effect on 1 January 1981). The volume of cargo-handling operations in seaports will increase 2 percent.

The share of the fully mechanized method in the handling of cargo is planned at a level of 93.8 percent, which means a growth of 0.4 point over the level attained in 1980.

According to the plan the output of ship repair yards in standard value added terms is to increase 3.7 percent, and labor productivity 2 percent in traffic operations, 1 percent in seaports and 2.1 percent in ship repair yards. The growth of labor productivity will account for 65 percent of the growth of output.

The production assignments envisaged by the plan are strenuous, but realistic. In order to fulfill them a thorough analysis will have to be made of performance in 1980, internal potential will have to be identified, and measures will have to be drafted at every enterprise to correct the shortcomings in increasing the pace at which vessels are processed and in reducing unproductive standing time. Success can only be achieved by raising the level of management of the shipping process using NPGRP [(?) continuous schedule-plan for operation of shipping], by improving the technology for carrying and transshipping cargo, and by improving further the operation of transportation junctions.

The principal task of enterprises in the maritime transport industry is to ensure the scheduled carrying of cargo and its transshipment in seaports along with the fullest and most efficient use of the fixed capital of transportation enterprises and labor and material resources. Indispensable to this is coordinated activity of all links in the transportation chain--the fleet, seaports, and railroad stations. Adoption of the continuous schedule-plan for operation of the transportation junction is a most important condition for fulfillment of planning targets at minimum

expenditure of transportation resources participating in the carriage and transshipment of goods.

The plan for the industry's economic and social development in 1981 calls for a further rise in the efficiency of utilization of the fleet and seaports. The average daily productivity per ton of cargo-carrying capacity is to increase 3.4 percent for the dry-cargo fleet, 0.4 percent for the liquid-cargo fleet, and 1.5 percent for the bulk-combined-cargo fleet. Successful performance of this task is especially urgent because in 1981 the fleet will experience practically no growth because a large number of outdated vessels are being retired. The slight increase (0.6 percent) in tonnage-days in traffic operations has been determined exclusively on the basis of the length and operating period envisaged in the plan.

If the higher planning targets are to be fulfilled with the limited productive capital, better use will have to be made of the available resources, higher efficiency will have to be achieved in operation of specialized vessels and higher productivity of operational and production lines in seaports, and the turnaround time of vessels will have to be diminished.

Since the fleet will not be sufficiently renewed, and operating periods will be longer for a number of vessels, a serious task arises of improving the quality of technical servicing of vessels and of raising the level of technical operation of the fleet, of reducing repair time and of ensuring the stated length of the operating period.

At the present time collectives of maritime transport enterprises are preparing for operation under the new conditions set forth in the decree of the CPSU Central Committee and USSR Council of Ministers dated 12 July 1979 and entitled "On Improving Planning and Strengthening the Influence of the Economic Mechanism on Increasing Production Efficiency and Work Quality," and in documents pertaining to transport and those issued to implement this decree.

People in the Ministry of Maritime Fleet and state cost-accounting associations are making a broad study of the basic principles set forth in that decree, they have drafted a number of departmental normative documents, and the normative documents issued by the Interdepartmental Commission of USSR Gosplan have been devolved to enterprises. The effort has been organized to draft a system of norms and standards to be used in planning at the enterprises of maritime transport. The draft of the Regulation on Procedure for Planning the Fleet's Reserve Carrying Capability has been written and has been sent to USSR Gosplan for its consent; the preliminary calculation has been made of the industry's financing under the conditions of profit distribution set forth in the decree already indicated of the CPSU Central Committee and USSR Council of Ministers, and a number of other measures have been taken.

In 1981 the transition needs to be made from the general study of the decree of the CPSU Central Committee and USSR Council of Ministers to preliminary (experimental) application of its basic principles in the practice of planning the operation of maritime transport enterprises. To that end shipping companies and state cost-accounting associations should take the requirements of the decree as their point

of departure in making preliminary calculations of the basic planning indicators and in making the preliminary calculation of the standard rates to be used in distribution of profit.

At enterprises that belong to the economic education network there is also a need to hold classes in the study of the basic principles of the decree of the CPSU Central Committee and USSR Council of Ministers using specific computational data based on the planning figures of enterprises.

The performance of measures to improve planning and to raise production efficiency necessitates a strengthening of planning and financial discipline, intensification of economic methods of management and strengthened importance of the economic substantiation of decisions being made.

Along with the entire national economy maritime transport has completed fulfillment of the 10th Five-Year Plan and has entered a new stage of its development. Much has been done in the last 5 years. Still more is to be done in the coming 5-year period.

The work ahead is extensive, complicated and very crucial. Intensification of production, raising the level and quality of management, improving the organization of work and work discipline, and inculcating a businesslike attitude, responsibility and initiative should be seen as the key problems in this stage. The successful work of collectives in the first year of the 11th Five-Year Plan to carry out the preliminary outlines which will be defined by the 26th congress of our party will depend in large part on the thoroughness and clarity of the tasks which are set and on ability to organize their performance. Safeguarding the realization of these projections is our principal task.

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OCEAN AND RIVER

TRAILER PROCESSING TROUBLES IN RIGA

Moscow VODNYI TRANSPORT in Russian 8 May 80 p 2

[Article entitled: "Where is the Trailer Delayed?"]

[Text] With the appearance at ports of the Latvian shipping company of vehicle carriers, the transportation system began to change over to a technology which is new in principle and promises huge economic benefits. New possibilities were opened up for longshoremen to reduce the time for loading and unloading motorships. Where, before, reckoning was in days, they began to shift to hours, and rather confidently, moreover.

Connected with this process is the entry into use by transport workers of the foreign word "roll-treyler" [trailer]. Its translation basically is "to wheel" or "to roll". The very design of trailers of all types and dimensions in the final analysis is made so that it is easier to roll and less easy to stand motionless. According to strict engineering ideas, and, yes, according to clearly commercial considerations, a loaded trailer which stands for a long time on the pier at a port is frozen capital, a lost opportunity for the better operation of ships.

Are modern operators content with the situation? Is their level of turnaround for the trailers which the shipping company has available being organized?

The answer is simple - it is not, and they are not satisfied. Very frequently in the operational planning for vehicle carriers, during discussion of the more remote prospects of their use by foreign participants, it turns out that there are not enough trailers - they are in very short supply.

In the maritime port of Riga this difficulty has become, perhaps, one of the most prolonged. If the forwarding of cargoes on trailers could have been confidently planned, operations on the traditional lines, Riga to France, Riga to Rostock, and Riga to the western shore of England would have become significantly more efficient.

The authoritative commission examining this aspect of the activity of Riga port-workers came to the conclusion that by no means had they done everything they should so that the fleet of trailers was used to the best advantage. It is noted, on the side of the leaders of the maritime port of Riga, that they do not have the control necessary for this important aspect of operations. The shortage of trans-

shipment equipment and areas, and the unpreparedness of road surfaces between the first and second regions of the port lead to a continuing growth in the number of damaged containers, trailers, and fletov [flat-bed trailers?]. It is impossible to consider as normal the fact that there is no specific place for the storage of trailers in the port, and that they stand practically all over the grounds and, besides, under the open sky. The damaged units are not taken out of service but are being kept in the general pool, which can lead to an unfortunate accident.

That same commission certified in its report that a significant part of the trailers and flat-beds is not being used as intended. At the time of the examination, specialists counted about a hundred of those which had stood for months at a time with import cargo. In the number of spares for loading, which attracted the special attention of the investigators, eight trailers and three flat-beds were found "stuck" on the piers of Riga since 1977. They had remained all this time [loaded] with the metal structures of a dismantled warehouse. Four other trailers, not in the best condition, were found in the port which, according to the will of the RSU [Remontno-Stroitel'noye Upravleniye?, Repair and Construction Administration?], had been turned into bins for the storage of cement.

Not all the pregrisheniya [obstructions?] sometimes attributed to the longshoremen depend only on them. A typical version of an unforeseen delay often occurs like this. On a vehicle carrier, an ordinary consignment of cargo arrives which the longshoremen expect to wheel out and forward according to destination. There is even a promise from the cooperating railroads that at an agreed time, box cars and flat cars will be provided for this. When the whole area by the pier is already crammed with loaded trailers, the railroaders suddenly make a retreat; there is no rolling stock and none is expected.

How shall the longshoremen act in this situation? If they take into account only the interests of the fleet and considerations of economic expediency (from the point of view of the shipping company), then the trailers must be disbanded without delay and the cargoes moved into a warehouse. But for this operation, as a minimum, there must be free areas and a spare labor force. Then there is always the other large question, not already mentioned, that the "spare" transshipment of the cargo is also undesirable from the point of view of the interests of the port since it brings with it a deterioration of its performance indicators.

Each week, vehicle carriers bring to Riga up to 2,000 tons of chemicals. In order to remove them from the trailers and forward them to destination, there must be railroad box cars. The demand for this kind of rolling stock was being satisfied, on the average, by not more than half.

The volume of incoming cargoes connected with the development of vehicle carrier transport has grown significantly, but the area for their storage has remained the same. Storage capacities limit the longshoremen, at times, no less than the scarcity of rolling stock.

Let us take up another aspect. It is not obligatory that trailers stand empty in port awaiting orders from shipowners. Also, the very technology of vehicle carrier transportation is such that longshoremen must have some of "their own" trolleys so that they can prepare cargoes for forwarding and make up the usual consignments of goods; but that, naturally, takes time.

What percentage of this equipment can the longshoremen keep for themselves on a "legal basis"? How much of it must be empty and how much loaded? On this, it seems that a calculation is needed - not a proposal. The clear standards which are needed unfortunately do not exist. Standards with engineering confirmation would make any conversation on this theme more impersonal and objective.

If the reasons for long delays of trailers under present conditions are to be defined concretely, attention must be turned to the responsibility of the clientele. The same [trolley] cable delivering the mass of troubles to the longshoremen, through no fault of theirs, is being delayed for [unloading] trailers because of the nonfulfillment by the local LATELEKTORADIOSNABSBYT [Latvian Electrical and Radio Suppliers] of their obligations as participants in the technological chain. Meanwhile, at the unloading ramp they serve, the scarce trolleys are being very slowly unloaded, thus disrupting the rhythm of vehicle carrier transportation. Many other such negligent clientele could be named. Perhaps the time has come to take effective measures catered to this problem on the scale of the transportation terminal as a whole.

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OCEAN AND RIVER

PERFECTING THE ORGANIZATION OF THE TRANSPORTATION PROCESS

Moscow VODNYY TRANSPORT in Russian 15 Apr 80 p 2

[Article by deputy minister of the maritime fleet, L. Nedyak]

[Text] Soviet maritime transportation is a highly developed sector of the national economy. Its present stage of development is characterized by a broad introduction into the technology and organization of the transport process of the scientific and technical achievements in domestic and worldwide shipbuilding and port construction. This permits fulfilling the total volume of cargo transport in all the maritime basins of the country, and the widening of the geographic operations of the fleet.

In 1979, Soviet ships completed about 40,000 calls at 1,390 ports in 121 countries.

The maritime fleet fulfilled the plan for the four years of the Five-Year Plan by 102.5% in coastal freight operations, and by 100.8% in overseas navigation.

Throughout all these years the collective of the Baltic shipping company - the permanent leader of socialist competition in the industry - steadily fulfilled transportation plans and socialist obligations. Good results were secured by the crews of the ships "Klim Voroshilov", "Vladimir Il'ich", and "Epifan Kovtyuk", and by the enlarged and combined teams of longshoremen led by A. Baranovskiy, V. Zimoglyad, and G. Batyunya.

The shipping companies and ports fulfilled major assignments in the transport and transshipment of raw sugar, pipe and equipment. Timber and petroleum cargoes for export were transported in significant volumes. In all this work there is, without question, the contribution of the central staff, the GKHO [Gosudarstvennoye Khoz-yaystvennoye Ob'yedineniye?, the State Economic Association?], the V/O [All-Union Association] "Sovfrakht", and the party organizations of the subdivisions of the ministry.

At the same time, it should be noted that in the operational and commercial work of the industry, there still are substantial deficiencies.

The operation of the fleet according to plans and schedules and on regular shipping lines is being disrupted. Foreign trade organizations have well substantiated grievances about tardy deliveries by the fleet in transporting export and import

cargoes in the Black and Baltic Sea basins. The introduction of continuous planning and scheduling of ship operations by computers is extremely important, especially for foreign trade transportation. But in this work also, everything is still not properly settled between the subdivisions of the Ministry of the Maritime Fleet and the Ministry of Foreign Trade.

With the creation of the GKHO, the necessary conditions were developed for more complete estimation and satisfaction of the needs of the clientele of maritime transport.

This permitted freeing the staff of the ministry's administration for fleet and port operations to work on the solution of problems in perfecting the planning, organization, and provision of the transportation process, on the development on a scientific basis of a number of standardizing documents, and on the reinforcing of assistance in the development and dissemination of progressive methods.

In a setting of great labor and political enthusiasm, maritime transport workers set about fulfillment of the transportation plans established for 1980.

Calculations show that the volume of export and import cargoes contemplated for the year are real and practicable. The shipping companies and the GKHO realize that these shipments must be carried out first.

Precisely on this part of our activities, however, there are still many deficiencies and unsolved problems. Requests for transportation by foreign trade organizations often are late or are changed.

On their part, the shipping companies are far from always carrying out promptly their commitments for the delivery of ships to carry foreign cargoes. There was the case, for instance, when the Latvian shipping company, chartering out idle tonnage in the export of transportation services, did this without taking proper account of the impending needs for transport of export cargoes.

At one time, the practice was successfully used of concluding direct agreements between the associations of the Ministry of Foreign Trade and the shipping companies or the GKHO. This had good results and permitted the steady and, as far as possible, smooth provision of transportation for foreign trade cargoes. Now it is necessary to return to that practice. Much of the difficulty is in the work with the orders of the MVT [Ministry of Foreign Trade] for transportation of export and import cargoes. Increasingly now, in the MMF [Ministry of the Maritime Fleet] there is attention to this work.

The qualitative indicators on the use of the fleet and the ports are still not at a sufficiently high level. We have shipping lines in which an expensive fleet is being used, but the efficiency of their work is less than for ordinary cargo ships. This applies to a number of lines of the Far East, Black Sea, and other shipping companies.

Most complex at present are the problems of processing ships in ports. In the Five-Year Plan, the port workers were able to cope with the plans for loading and unloading operations by driving the level of comprehensive mechanization up to

93.2 percent. To a decisive degree, the system of continuous planning on the basis of the mutually coordinated plans and schedules of the interfacing transportation systems which has been introduced at 36 transportation terminals, exerted an influence on the positive results of their work. It permitted a 5-6% reduction in the time to process ships, a 7-12% reduction in the time to process railroad cars, and a 15-20% reduction in processing trucks. The productivity of labor in loading and unloading operations amounted to 103.3% of the plan.

The unproductive idleness of ships in ports, however, is still rather large. It is known that the majority of them operate with an overload which in some cases exceeds standard throughput capacity. The gross rate of processing ships in 1979 not only was not increased relative to 1978, but was even reduced by more than 2%. This happened in such ports as Leningrad, Riga, Odessa, Il'ichevsk, Vladivostok, and Nakhodka. We know also that the railroads operate under such stress and we are taking steps to accelerate the processing of railroad cars in every possible way. The port workers make only one request of the railroad men - that the established plan for the average daily delivery of railroad cars be rigorously fulfilled. This is the rule in all planning systems. Between them, as a rule, the ports receive only 70-80% of the cars in the plan.

In their turn, the port workers are obligated to process all delivered railroad cars completely and on time. The coordinated activity of interfacing forms of transportation and clientele within the framework of transportation terminals and on the basis of scientifically founded standards, is the highest form of modern administration of the transportation process. It permits efficient use of material and labor resources. Therefore, special attention should be given to the successful operation of the transportation terminals everywhere.

Every day, by new production achievements, competition is being expanded among the personnel of the maritime fleet for the observation of the 110th anniversary of the birth of V. I. Lenin.

In his statement at the meeting of the Presidium of the Supreme Soviet of the USSR on March 4th this year, the General Secretary of the CC CPSU and Chairman of the Presidium of the Supreme Soviet, L. I. Brezhnev said: "For us the key things that remain are the tasks of increasing the effectiveness and quality of labor, of improving the guidance of the national economy, and of the unconditional fulfillment of planned assignments."

These instructions of Comrade Brezhnev are the battle plans for action for the many thousands of collectives of workers in the maritime transport service which will devote all efforts, knowledge and skill to honorably cope with the tasks assigned to it.

OCEAN AND RIVER

TECHNOLOGY OF SHIP REPAIR

Moscow **TEKHNOLOGIYA SUDOREMONTA** in Russian 1976 (signed to press 30 Aug 1976)
pp. 2, 428-432

[Annotation and table of contents from the book "The Technology of Ship Repair" by Dmitriy Dmitriyevich Benkovskiy, Izdatel'stvo "Transport" 7000 copies, 432 pages]

[Text] The textbook presents a new technique for the study of the technology of ship repair in which the principal attention is given to defects in parts of shipboard machinery, mechanisms, and structures, to the reasons for them, and to the methods of exposing and eliminating them. Characteristic defects and methods of eliminating them are illustrated by examples on specific parts.

A classification of defects and the reasons for them, developed by the author, is presented, and new technological processes are described. Major attention is given to consideration of the reasons for wear of, and damage to, shipboard parts and structures and to the classification and methods of flaw detection.

Repair operations for the elimination of specific kinds of defects are classified.

The textbook is intended for students of higher educational institutions who are studying ship repair, and it can be recommended for ITR [Engineers and Technical Workers] of ship repair plants and shipping companies.

There are 232 illustrations, 21 tables, and a bibliography of 31 titles.

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OCEAN AND RIVER

USSR SHIP IMPORT, EXPORT GROWING

Moscow VODNYI TRANSPORT in Russian 21 Mar 81 p 4

[Article by M. Mikhaylov: "'Sudoimport' Presents ..."]

[Text] A press conference for Soviet and foreign journalists and business people has been held at the International Trade Center in Moscow by V/O Sudoimport [All-Union Cost-Accounting Foreign Trade Association for Export, Import and Repair of Ships].

"The association now maintains business contracts with 800 firms and organizations in 80 countries," reported O. Kropotov, the association's general director. "Last year V/O Sudoimport was awarded the international prize 'Gold Mercury' for its fruitful contribution to development of foreign economic relations, good relations and cooperation among members."

It is stated in the Basic Directions of the USSR's Economic and Social Development adopted by the 26th CPSU Congress: "Replenish the fleet with specialized vessels--container carriers, lighter-carriers, seatrains, vessels for arctic navigation and icebreakers." These lines apply directly to the activity of V/O Sudoimport.

Last year the association signed large contracts with the Finnish firms Vyartsilya and Valmet for delivery to the USSR during the new 5-year period nine multipurpose icebreaking merchant vessels for arctic navigation. Two out of three gas carriers of quite recent design have already been delivered from Italy. The Kholmig firm (Finland) has delivered the custom-made scientific research vessel "Akademik Mstislav Keldysh," which is one of a kind. Deliveries have been completed from the same country of a series of river-maritime vessels of the "Ladoga" class and 14 motor vessels for the rivers of Siberia. High-capacity suction dredges for bottom-dredging operations have been purchased in Yugoslavia, and dredges and river passenger vessels are arriving from Czechoslovakia.

Throughout the world the continental shelf is now being developed intensively. Large contracts have been concluded with French firms to purchase equipment for production of stationary platforms for offshore petroleum and gas production and also for delivery to Soviet shipbuilders of complete manufacturing equipment for a specialized shipyard plant.

But the association is not only importing, but is also exporting vessels and equipment. Last year alone it delivered 171 ships to various countries. They included ore carriers of the "Baltika" class, which has a deadweight tonnage of 38,250 tons, ro-ro vessels, and fishing, harbor and service vessels. For the first time in 1980 Soviet timber and palletized-cargo carriers were delivered to the GDR and research and fishing vessels to Bulgaria. Our trawlers went for the first time to Australia, and a floating dock and ocean trawler to Turkey. Finland and Italy purchased ocean-going petroleum and trash skimmers, and Yugoslavia a dry-cargo vessel of the ro-ro type. Two out of five products carriers ordered by the firm Athenian Tankers Management have been delivered to Greece; the prototype vessel was given the name "Moskovskaya Olimpiyada." The Kiliya yard has begun to deliver lighters on the international market.

Finland and other countries have been interested in Soviet hovercraft.

Ocean-going hydrofoil vessels of the "Kometa" class have won widespread recognition abroad. In Greece alone there are 14 "Kometa" in service; 10 are in operation in Yugoslavia and the same number in Italy.

The Ship Repair and Construction Yard imeni S. Ordzhonikidze in Poti, which incidentally was also awarded the "Gold Mercury" prize, has created a new and improved hydrofoil passenger vessel, the "Kolkhida," which accommodates 140 passengers and has a speed of 40 knots and has aroused the interest of a number of countries.

Marine equipment, which is being delivered to more than 30 countries, occupies an important place in the exports of V/O Sudoimport.

Incidentally, a new thing in the association's export program--the IEL-2M electronic log, which works by induction--last year won the highest award of the Poznan International Fair--a gold medal.

Agency agreements have been concluded with a number of firms which call not only for selling goods in the export program, but also for technical servicing and the training of operators. Bonded warehouses and repair stations have been set up in such countries as Italy, Finland, West Germany, Japan, Cuba and a number of others; at shipowner's request they send out the necessary replacement parts to any point on the globe.

V/O Sudoimport's business contacts with various countries are expanding and growing stronger every year.

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OCEAN AND RIVER

PLAN UNDERFULFILLMENT, LONGSHOREMEN NEGLECT SCORED

Moscow VODNYI TRANSPORT in Russian 21 Mar 81 p 1

[Report on meeting of the party aktiv of the USSR Ministry of Maritime Fleet: "We Will Perform What Has Been Outlined"]

[Excerpts] The cargo traffic plan for the first 2 months of 1981 was fulfilled at a level of 108.5 percent for coasting and 102 percent for foreign shipping, at a level of 108.9 percent for cargo-handling operations in seaports, and at a level of 100.5 percent for output of ship repair plants.

However, while they were justly proud of the achievements of Soviet maritime transport, representatives of the party aktiv of the MMF [Ministry of Maritime Fleet] paid principal attention at their assembly to the new tasks of the industry and to those complicated problems which have so far remained unsolved and have been hindering consistent forward movement.

In the report and the statements in the discussion uncompromising criticism and self-criticism was repeatedly heard, and there was keen concern about certain painful issues. It was noted that the Murmansk, Caspian and Georgian shipping companies did not fulfill plans for the first 2 months of this year with respect to certain indicators. Whereas a whole the country's seaports overfulfilled the 2-month plan by 8.9 percent, in Baku, Nagayevo, Pos'yet and Nakhodka, for example, plans were not fulfilled.

Party members of the MMF referred to their own underfulfillments, which have been adversely affecting the efficiency and quality of performance of various parts of maritime transport.

Party members of the Administration for Operation of the Fleet and Seaports, of GKKhO's [state cost-accounting (khozraschet) association] and of other subdivisions have still not been adequately studying, summarizing and putting to creative use experience in using the NPCRTU [continuous schedule-plan of the operation of a transportation junction] and the experience of intersector socialist competition.

The computer centers and ASU "B" are not being put to full use in administration of the industry at the present time; without them it is impossible under present conditions to perform the real task which has been stated in the main addresses

at the party congress delivered by Comrade L. I. Brezhnev, general secretary of the CPSU Central Committee, and Comrade N. A. Tikhonov, chairman of the USSR Council of Ministers: to persistently raise the level of administration and planning.

The necessary exactingness is not being shown toward the managers of shipping companies in increasing the effective employment of specialized vessels and the stock of containers.

Administrations of the ministry and GKbO's have been slow to correct bottlenecks in the activity of seaports and have not been taking adequate measures to increase the level of organization and discipline, to mechanize laborious operations, and to improve the social conditions and consumer services of longshoremen.

In almost all the statements delivered at the assembly particular concern was shown for the situation in processing cargo in seaports. Their operation demonstrates with particular clarity how closely intertwined and interdependent are economic and social problems. The longshoreman who operates a machine is the central figure in the port. More attention should be paid to him. Everything needs to be done to halt the turnover of workers in seaports.

Here again we need joint efforts by the Personnel Administration and other components of the MMF. In particular, it was noted at the assembly, the Administration for Development and Capital Construction has for a number of years failed to fulfill plans for construction of housing and consumer service projects and assignments for elimination of barracks and living quarters in basements. The experience in seaport operation and an analysis of that experience by the ministry's personnel show that concern about housing and consumer services is the first thing needed to reduce personnel turnover.

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OCEAN AND RIVER

SNAGS IN USE OF ORE-HANDLING COMPLEX

Moscow VODNIY TRANSPORT in Russian 24 Mar 81 p 2

[Article by V. Belich: "On the Basis of Common Interests"]

[Excerpt] Recently the first train arrived at the complex carrying Krivoy Rog iron ore on the Komsomol-youth relay-race line between Krivoy Rog and Nikolayev. This inspired personnel in the port of Nikolayev with a serious hope of broader and deeper cooperation with railroad personnel.

Unfortunately, the trains now carrying the ore are made up gondola cars of various sizes, including some which have been poorly prepared for carrying bulk shipments. There are cases when a chink in one of them has been stopped up with a loose board, and when the wagon is tipped, it naturally falls out and hangs up in the chute of the bin. Then the equipment-operator seamen become ordinary longshoremen, they arm themselves with crowbar and shovel, and they go to clear the obstruction. But this, of course, takes quite a few precious minutes. Lubricant is constantly pouring out of the car's journal box, dividers and chute gates fall out. Sometimes foreign objects reach the conveyor along with the ore, get wedged in it, and tear the belt. Not only does a belt like this cost several tens of thousands of rubles, it is also a scarce item.

What is the solution?

It has been unambiguously indicated by the miners, who are disturbed by the losses of ore in shipment, by railroad personnel, who are motivated to carry as much freight as possible, and by longshoremen, who want to use the ore complex at full capacity. This version has been proposed--12 trains each consisting of 44 all-metal gondola cars on roller bearings would shuttle on the Krivoy Rog--Nikolayev run. In view of the situation in rail transport, it is clearly no simple matter to realize this idea, but it is indispensable to solve the problem of bringing the Nikolayev ore complex up to rated capacity.

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NEW MARINE GAS-TURBINE POWER PLANT

Moscow MORSKOY FLOT in Russian No 11, Nov 80 pp 31-34

[Article by A. Markov and V. Lisov: "Gas-Turbine Power Plant of the Ro-Ro Vessel 'Kapitan Smirnov'"]

[Text] The gas-turbine power plant (GTU), consisting of two M25 main gas-turbine units (GGTA), each of which drives its own fixed-blade screw, has been adopted on the twin-screw vessel "Kapitan Smirnov."* Their total capacity gives the ship a speed of about 25 knots. Each unit consists of an automatic reversible D159 gas-turbine engine (GTD), an R025 reducer, a heat recovery loop (TUK) and auxiliary machinery and devices.

The power plant (Figure 1) provides a maximum AC power of 36,780 kw (when steam is not extracted for the turbogenerator and for the needs of the ship). The power plant allows one GGTA (Figure 2) to drive a screw while the other driveshaft is inoperative, either braked or turning freely. It is also possible for the GGTA on one side to drive its screw while the steam generated in its waste-heat boiler will go to the steam turbine of the second unit to turn the other screw. The main gas-turbine units can be operated in a "stop-screw" pattern at a power below 50 percent of rated power when the screw is not turning. All of these operating patterns of the GTU guarantee the vessel's excellent maneuvering features.

The electric power plant includes two TGU1000 turbogenerators each with a capacity of 1,000 kw, which are driven by the reheated steam of the waste-heat boilers of the TUK, and three automatic DGR1000/750 diesel generators, each with a capacity of 1,000 kw, which are driven by four-stroke Model 6ChN30/38 diesels. The control system of the electric power plant provides for parallel operation of the diesel- and turbogenerators in any combination of the units.

The backup source of electric power is a DGRA-200/1500R diesel generator with a capacity of 200 kw. The current is AC, three-phase, with a frequency of 50 cycles, and a voltage of 400 V.

* A full description of the gas-turbine power plant is given in the journal SUDOSTROYENIYE (No 3, 1980).

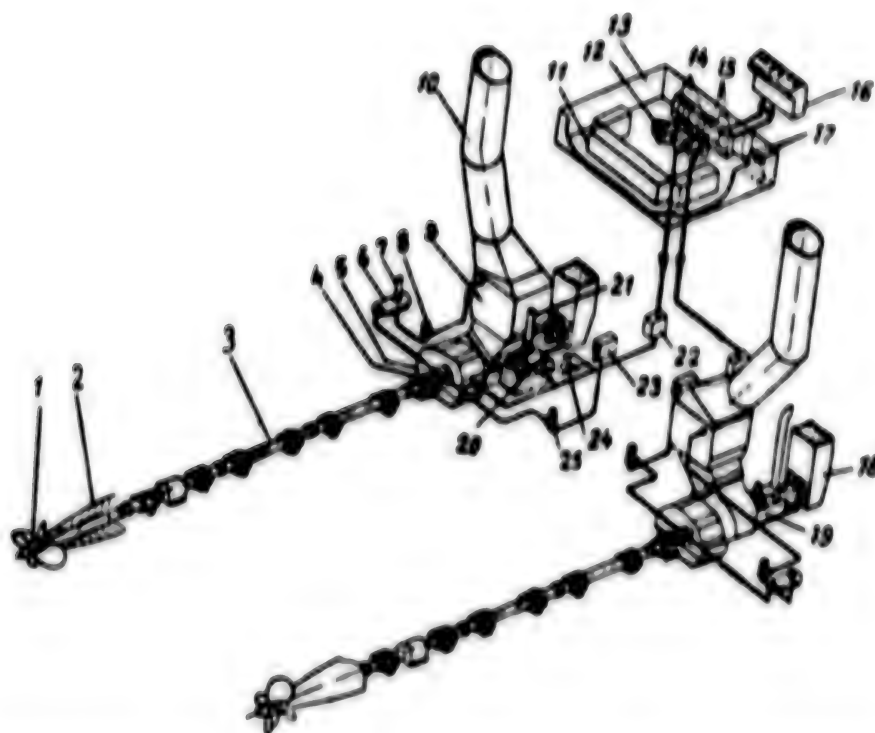


Figure 1. Gas-turbine power plant: 1--screw; 2--gland; 3--propeller shaft; 4--steady bearing; 5--reducer; 6--steam separator; 7--pipe delivering the steam to the waste-heat boiler for reheating; 8--circulating pump; 9--waste-heat boiler; 10--exhaust gas pipe; 11--main switchboard; 12--control panel in the central control panel (TsPU); 13--TsPU; 14--switchboards of the "Izhora" system for automatic remote control of the power plant; 15--switchboards of the "Shipka" centralized monitoring system; 16--control panel in the wheelhouse; 17--switchboards of the complex for controlling the shipwide "Naroch'" system; 18--air intake shaft; 19--gas-turbine engine; 20--steam turbine; 21--pipe delivering steam to the steam turbine; 22--station for control of the GTD; 23--hot well; 24--condensate pump; 25--feed pump.

When the vessel is in harbor, provision has been made for it to receive steam from an auxiliary boiler with an output of 6 tons per hour, which generates saturated steam at a working pressure of about 500 kPa. When the ship is under way, steam is delivered to the ship's consumers from the TUK.

The compressed air plant is made up of two automatic EKSA-7.5-4 high-pressure compressors, which deliver 13 liters of compressed air per minute at a pressure of about 20 MPa, and two EKP70/25 electric medium-pressure compressors, which deliver about 70 cubic meters per hour of untreated air at a pressure of 2.5 MPa, with a corresponding number of high- and medium-pressure compressed air cylinders. Two units are provided for cleaning and dehumidifying the high-pressure air. The MZ water distillation plant, which has an output of 60 tons per day, operates on steam from the heat-recovery or auxiliary boilers.

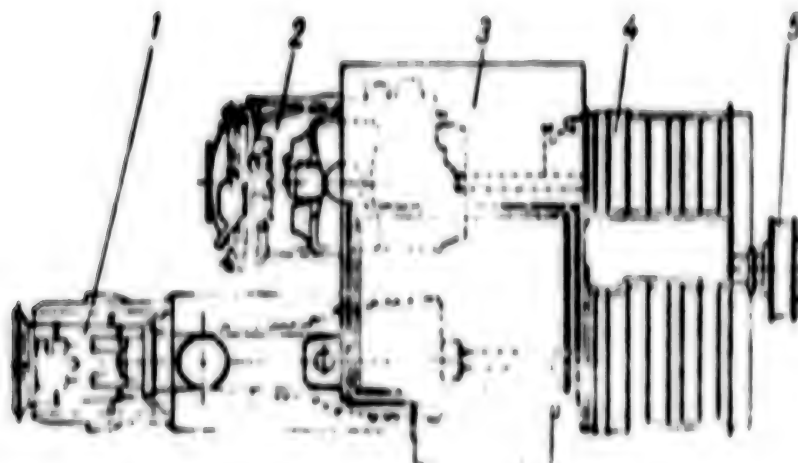


Figure 2. Port main gas-turbine unit: 1--gas-turbine engine; 2--steam heat recovery turbine; 3--steam boiler; 4--reducer; 5--clutch.

The power plant is fitted out with the necessary machinery and equipment to ensure normal functioning of the GGTA, the diesel- and turbogenerators, the auxiliary boiler, and also the oil and fuel cooling systems.

The engineering space (MKO) is located in the stern of the vessel, which affords maximum use of the volume of the cargo space. But with the twin-screw propulsion system, this solution created serious difficulties in placement of the machinery and equipment because there is so much of it for the space. In addition, the GGTA had to be installed in soundproofed compartments in order to improve operating conditions, which also made it more difficult to locate the pieces of machinery and lay pipes in the MKO.

The hold accommodates the main units (in a soundproofed compartment), the machinery of the ship's systems, and also the machinery and devices of the fuel preparation system, which include separators, heat exchangers, tanks and other equipment of the MKO. The GTD may be operated with diesel and gas-turbine fuel (on the first operating voyages of the prototype vessel the GTD have operated on diesel fuel).

The turbo- and diesel-generators, the auxiliary and heat-recovery boilers, the machine shop, a storeroom, a room for pressure testing the nozzles and a laboratory for fuel and oil analysis are located on the platform deck.

Much attention was paid in the design process to developing a device for the intake and cleaning of air for the GTD. This problem was solved successfully through an R&D program, so that sedimentation of salts in the flow-through part of the low-pressure compressors has been reduced and a deterioration of the operating characteristics of the GGTA thereby averted.

In the spaces where air is received louvers, whose fins have a special shape and separate moisture from the air, and Porolon filters treated with caustic soda have been provided. Air reaches the GTD through welded air-intake shafts. The interior surfaces of the shafts and air-intake spaces are covered with sound-absorbing insulation.

Two spare GTD have been provided for on the vessel; they are stored in the hold adjoining the MKO. Special appliances and removable rails, and also closable cutouts in the bulkhead and air-intake shafts, are used to replace the GTD.

Each driveshaft line consists of a fixed-blade screw, the propeller shaft, the gland with Simplex packing, the brake, three intermediate shafts, steady bearings, a thrust shaft, and a thrust bearing. Sternward removal of the propeller shaft has been provided for after disconnection at the coupling. The screws are four-blade, they rotate left and right, and they are made of high-strength bronze. The screw diameter is 5.7 meters.

The steam generated by the heat recovery boiler is used in the steam turbine, the turbine of the heat recovery turbogenerator and for general ship's needs.

The GTD is a single-path, two-stage, axial unit consisting of two-stage high- and low-pressure turbines (TVD and TND) placed in series and a reversible three-stage screw turbine (TV). The unit also includes the tubular-annular combustion chamber (in whose housing are mounted 10 flame tubes with nozzles) and two axial compressors--a low-pressure compressor with 7 stages and high-pressure compressor with 9 stages (KND and KVD, respectively).

The high-pressure turbine drives the KVD, and the low-turbine turns the KND. The torque from the TV is transmitted through flexible couplings and the shaft to the reduction gear. The housings of the compressors, the combustion chambers and the turbine casings are incorporated into a single unit. There are internal and external deflectors at the input to the KND, the exhaust pipe is located behind the screw turbine, and the GTD is fastened on the frame by six mounts. The hot part of the housing is covered with a thermal insulating jacket.

The triple reduction gearing (Figure 3) has two branches to which the GTD and the steam turbine are connected. The branch of the GTD splits into two in the first power train of the reduction gear and is divided into four flows in the second train. The branch of the steam turbine divides into two in the second train, and the GTD is connected to the reduction gear through flexible couplings and a shaft. The steam turbine is connected to the reduction gearing by a friction-claw clutch, which automatically disengages when the steam turbine is shut down.

The torque from the GTD and the steam turbine along the two branches through the six driving pinions is transmitted to a single driven wheel connected to the propeller shaft through a flexible coupling which protects the reduction gearing from the axial vibrations of the propeller shaft. All the pinions and wheels rotate on slide bearings. The housing of the reduction gear is welded and cast, ribbed, made from steel sheet, and the bearing blocks are cast. The removable housing consists of upper and lower halves and has upper, side, forward and rear plates. The GTU has several systems which serve to ensure its normal functioning and breakdown-free operation.

The heat recovery boiler is located above the gas exhaust of the GTD and is connected to it by means of a compensator. The steam output of the boiler is 26 tons of steam per hour at a pressure of 1.2 MPa. It is a water-tube forced-recirculation boiler rectangular in its cross section. It consists of the following basic

assemblies: the economizer, the evaporating surface and steam reheater, between which there are support beams to reinforce the clusters of tubes. The coils of the boiler's tube clusters are made of finned tubing. The fins are formed by a spirally wound ribbon welded to the pipe. The double casing ensures the pressure seal of the boiler and affords the possibility of reducing the thickness of insulation. The air-gas ejector, which is located after the boiler, successively sucks up the cooling air under the thermal insulating jacket of the GTD, the jacket of the gas exhaust and the space between the boiler's two casings. Four horizontal supports and anchors have been provided to strengthen the boiler. A washer has been provided for to periodically wash the heated surfaces of the boiler. The boiler also incorporates a horizontal steam separator and fittings, which serves at the same time as the water tank of the TUK.

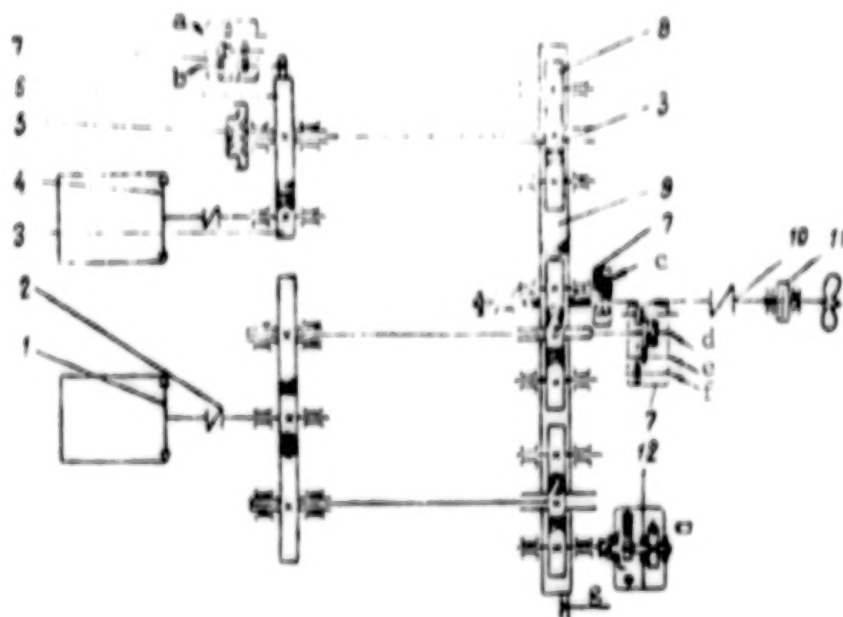


Figure 3. Reduction gearing: a, d--to the tachometer pickup; b, e--to the synchronizer pickup; c--to the reversograph pickup; f--to the centrifugal pickup of the oiling unit; g--to the suspended oiling unit; 1--gas power turbine; 2--torsion shaft; 3--pinions; 4--steam heat recovery power turbine; 5--friction-claw clutch; 6--wheel driven by the pinion; 7--gear box; 8--intermediate gear; 9--follower; 10--flexible coupling; 11--main thrust bearing; 12--shaft-turning device.

The steam turbine of the condensing type has a welded-cast casing in which the bearings of the rotor are located.

There is a flange on the top cover to melt the quick-closing steam inlet valve, a flange is welded to the exhaust pipe to reinforce the reduction-cooling device. The turbine's exhaust pipe is connected to the condenser through a compensator.

The steam turbine's rotor is supported at two points, its disks are shrunk on, and the rotor consists of one wheel with two velocity stages and seven pressure stages.

The thrust bearing is two-sided and self-adjusting babbitt-lined thrust segments, and the thrust collar is in addition made one with the rotor shaft. The journal bearings are babbitt-lined.

The two-pass condenser is of the surface type and is the frame from which the steam turbine and auxiliary equipment are arrayed.

Atmospheric air is compressed by the two-stage compressor, and the fuel is burned at constant pressure in the combustion chamber of the GTD. The gas that is formed expands successively in the TVD, TND and TV, and the power is transmitted from the TV through the reduction gearing to the screw. After the GTD the gas goes at a temperature of 390° C to the recovery boiler (gas consumption 91.8 kg per second) in which the gas temperature drops to 179° C because of heat delivery. Feedwater at a temperature of 40° C is sent by the feedwater pump from the hot well to the separator of the steam boiler. The forced-recirculation pump delivers the water successively to the economizer and the evaporation part of the boiler. Then the steam-water mixture goes to the steam separator, from which the wet steam is sent to the steam reheater and via the main check valve to the quick-closing valve of the steam turbine. The main check valve opens automatically at a steam pressure of 390 kPa. Through it the steam goes to the main ejector. When a vacuum of 49-59 kPa is attained in the condenser, the quick-closing valve opens, taking the no-load position, and the frequency of rotation of the steam turbine begins to increase. Upon attainment of synchronous frequency of rotation the steam turbine automatically engages with the reduction gear.

During this time excess steam is removed through the ROU [pressure-reducing and cooling system] into the exhaust pipe of the steam turbine and to the condenser. After the steam turbine is warmed up in the no-load mode for 12-15 minutes, the quick-closing valve opens completely, and the steam turbine takes on the rated load. Until the quick-closing check valve opens completely, steam is continuously blown through the steam line through automatic blow valves.

The TUK goes into operation as the feedwater is delivered to the boiler, and this occurs in any mode of operation of the GTD (hot start) and when the GTD is not operating (cold start).

The main ejector creates a vacuum in the condenser at a steam pressure of 390 kPa and higher. The steam turbine engages at a steam pressure that is not below that indicated. Depending on the temperature of the outside air, this steam pressure may be obtained at modes of operation of the GTD between 20 and 50 percent below the nominal capacity. Since the economic efficiency of the unit has no essential significance when maneuvers are being made in a port, and the steam turbine is disengaged at the frequency of rotation of astern operation, the "port" and "at sea" modes are distinguished. During operation in the "port" mode, the TUK of the unit is inoperative, but the TUK becomes operative in the "at sea" mode.

The operating life of the unit is rated at 100,000 hours, the operating life of the main assemblies of the GTD before major overhaul under plant conditions is 25,000 hours with the GTD operating 85 percent of its operating life in the nominal mode. During that operating life, after 50,000 hours of operation, provision is made for

one major overhaul of the reduction gearing. The service life of the GGTA is 25 years, that of the GTD 12.5 years, and provision is made for pulling apart the RTD and examining the individual assemblies of the unit once every 4 years from the date when the vessel is delivered for service.

The GGTA has a high degree of repairability. For instance, in 2 or 3 hours any mounted unit of the GTD can be replaced under operating conditions (gear box, fuel pump, oil pump, and so on). Provision has been made for complete replacement of the GTD with the spare kept on the vessel.

The gas-turbine unit is controlled through the "Raskat" system from the navigation room or from the TsPU [central control panel]. Control from the navigation room is automatic remote control from a panel or from two remote control pedestals on the wings of the conning bridge, combined with ship's telegraph. The following are done in this manner: the ship's speed is changed by regulating propulsive power; reverse and "stop-screw" programs are worked out, and other operations are performed.

Commands are issued by remote control from the TsPU as follows: to the control systems of the GTD and TUK for remote switching of the machinery and devices which are part of the GGTA; to the control system for start, false start, for turning the engine over cold and for stopping the GTD; to the automatic equipment of the TUK for start and stop (with or without the steam turbine); to change the power of the GGTA; to work out reverse and "stop-screw" programs with signals to the automatic control and protection system; for switching from diesel fuel to gas-turbine fuel, and so on.

The TsPU is located on the main deck above the electric generators; in it are accommodated the panels and switchboards of the system for controlling and monitoring the operation of the ship's power plant and the main switchboard; this has considerably shortened the length of the power cable from the generators to the main switchboard. The GTU may not be controlled simultaneously from two points. There is remote control of each GGTA from the TsPU by means of a mode lever and a reverse lever, combined with the responder of the ship's telegraph.

The propulsion machinery is prepared for operation from local stations, but the start of the GTD is controlled from the TsPU. In forward operations of the ship the steam turbine can be engaged from the TsPU when the power of the GGTA is about half of rated power. It is disengaged and stopped by remote control, which also occurs automatically in the following cases: when the GGTA is switched to the maneuvering mode; during reversing from forward to astern operation; when the GGTA is switched to the "stop-screw" mode; should the power of the GGTA drop below the level sufficient for efficient operation of the steam turbine (50 percent of nominal).

The extent of the automatic control ensures control of the power plant by a single watch officer at the TsPU without a permanent watch in the MKO, which is sufficient for awarding the automatic control symbol A2 of the USSR Ship's Register in the designation of the ship's class.

The first operational cruises have demonstrated the high maneuvering characteristics of the vessel and indicate that use of the GGTA on vessels of the maritime fleet is promising.

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